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ANNUAL REPORT

OF THE

TRANSIT DEPARTMENT



OF THE

CITY OF BOSTON

1922

★ No. 6355.5

1922



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COMPLIMENTS OF

TRANSIT DEPARTMENT — CITY OF BOSTON

THOMAS F. SULLIVAN, *Chairman.*

FRANCIS E. SLATTERY,

LOUIS K. ROUBKE,

*Commissioners.*



ANNUAL REPORT

OF THE

TRANSIT DEPARTMENT

FOR THE

YEAR ENDING JANUARY 31, 1923



CITY OF BOSTON  
PRINTING DEPARTMENT  
1923



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Dec. 30, 1949

ANNUAL REPORT  
OF THE  
TRANSIT DEPARTMENT

FOR THE YEAR ENDING JANUARY 31, 1923.

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1 BEACON STREET, BOSTON, MASS., February 1, 1923.

*To the Mayor and City Council  
of the City of Boston.*

In accordance with the requirements of the existing ordinance, the Transit Department respectfully submits the following report:

REORGANIZATION OF DEPARTMENT.

On March 13th the City Council, upon the recommendation of His Honor, the Mayor, passed the following ordinance, providing for the reorganization of the department:

"CITY OF BOSTON.

IN THE YEAR NINETEEN HUNDRED AND TWENTY-TWO.

AN ORDINANCE CONCERNING THE TRANSIT DEPARTMENT OF THE  
CITY OF BOSTON.

*Be it Ordained by the City Council of Boston, as follows:*

SECTION 1. Chapter three of the ordinances of nineteen hundred and eighteen is hereby amended by striking out section one and substituting therefor the following new section:

SECTION 1. The transit department shall be under the charge of a board of three commissioners, appointed by the mayor, for the term of one year each, one of whom he shall designate as chairman. The chairman shall receive a salary of seven thousand five hundred dollars a year; the

other members shall receive each a salary of five thousand dollars a year. The board shall appoint a secretary, engineers, subordinates and employees, define their powers and duties, and fix the amount of their compensation.''

Approved by the Mayor March 14, 1922.

Edmund Billings, who had served as chairman from November 23, 1921, resigned on March 11th, to take effect April 1st, and this resignation was accepted by His Honor, the Mayor, on March 17th.

Frank S. Deland, who had served as commissioner from August 24, 1921, resigned on March 13th.

On April 1st Commissioner of Public Works Joseph A. Rourke was designated as acting commissioner until a second commissioner had qualified.

On April 1st Thomas F. Sullivan was designated as acting chairman of the board. On April 3rd he qualified as Transit commissioner and was designated chairman, and on the same date Francis E. Slattery qualified as commissioner. On April 12th Louis K. Rourke qualified as commissioner.

#### OFFICE QUARTERS.

The increased activities of the department made necessary more space for its office quarters and an arrangement was made whereby the lease of its offices on the sixth floor of the Albion building was cancelled and a new lease executed for rooms on the seventh floor.

#### EAST BOSTON TUNNEL ALTERATIONS.

A statement of the progress in detail of the work of construction of the underground station of the East Boston tunnel at Maverick square will be found in the appended report of the chief engineer.

At the request of the trustees of the Boston Elevated Railway Company, the board voted to make provision in the station for an enlargement of the trainmen's lobby, with an additional office for train starters, a tool room, trackmen's lobby, signal tower, and signal room, at an estimated cost of \$25,000.

The platforms of the Devonshire station of the East Boston tunnel are being extended for a distance of thirty feet to adapt that station to use by train service upon completion of the Maverick square station. This work is being done upon request of the Boston Elevated Railway Company at an additional

estimated cost of \$45,000, and is being carried on in such a manner as not to interfere with the operation of cars through the tunnel.

The board has voted to proceed with the work of raising platforms at Bowdoin and Scollay Under stations of the East Boston tunnel extension, and Devonshire and Atlantic avenue stations of the East Boston tunnel, to adapt those stations to use for train operation upon completion of the Maverick square station.

#### UNDERGROUND STRUCTURES.

Before taking formal action upon the question of removal and relocation of underground structures where they were deemed to interfere with construction work, conferences were held with representatives of the various companies owning such structures and the chief engineer was instructed to furnish each company with copies of such plans as may be necessary.

A manhole to be used as an outlet for cables carried through the East Boston tunnel is being constructed in accordance with request of the Boston Elevated Railway Company, at an estimated cost of not exceeding \$1,500.

#### TREMONT STREET SUBWAY.

The platforms of the Haymarket square and Adams square stations, and the northbound and southbound platforms at Boylston street have been lowered to bring the edges of these platforms at an elevation of three inches above the rail.

Certain changes were made in the location of columns at the Scollay square station to give longer available platform space for northbound cars.

Studies were made for an enlargement of the Park street station of the Tremont street subway providing for an additional platform under Tremont street adjacent to the northbound outside track, with entrances and exits on Tremont street in the vicinity of Temple place, but of a much smaller design than the existing Tremont street entrances.

#### BOYLSTON STREET SUBWAY.

Negotiations for the purchase of the city yard property, so called, terminated, and the check deposited as part of the purchase price was declared forfeited by reason of failure to complete the purchase.

## EAST BOSTON TUNNEL EXTENSION.

The property located at 113 Cambridge street, being such portion of the property taken for the purposes of the East Boston tunnel extension and no longer needed for such purposes, was sold on January 6, 1923.

## WASHINGTON STREET TUNNEL.

Approval was given to the Boston Elevated Railway Company to make certain alterations in a part of the Washington street tunnel in connection with the opening of a passageway from the Devonshire street entrance to the Winthrop building.

## ARLINGTON STATION.

Bids were received on June 20th for furnishing and laying about 5,200 square yards of wood block pavement on Boylston street, between a line about 75 feet west of Berkeley street and a line about 150 feet east of Arlington street, and the contract for this work was awarded to the lowest bidder, the B. E. Grant Company. Amount of the bid was \$23,200. Work was completed on August 14th.

## DORCHESTER TUNNEL.

Approval was given to the Boston Elevated Railway Company to make certain alterations in the space beneath the surface of Winter street, between Tremont and Washington streets, known as the Winter street gallery, upon terms and conditions set forth in agreements between that company and Shepard Norwell Company, Gilchrist Company and Conrad & Company for use of this gallery as approved by the Department of Public Utilities.

## CAMBRIDGE CONNECTION.

The work of widening the stairway from the southerly platform of the Cambridge Connection to the westerly platform of the Park street station, and of the approach from the lower platform was completed on August 22nd.

## DORCHESTER TRANSIT PROBLEM.

The department has held many conferences with the Department of Public Utilities relative to extending the high speed service to Dorchester from the present terminus of the Dorchester tunnel at Andrew square.

When the Dorchester tunnel was constructed, Andrew square station was designed for a way station, and its use as a terminal was contemplated only pending the construction of a route south of that point. The length of surface track in this station is wholly inadequate for the train service operated to that point, and this results in an intolerable congestion, particularly during the rush hours.

A bill has been prepared for presentation to the incoming legislature for an extension of the Dorchester tunnel from its present terminus under Boston street to a point just south of Dorchester avenue, coming to the surface on an incline to the existing road bed of the Boston division of the New York, New Haven & Hartford railroad, where it is proposed to utilize the westerly portion of the New Haven track area from that point to Harrison square for a double track high speed line.

This will necessitate the widening of bridges on Columbia road and Savin Hill avenue and the relocation of the New Haven track on land to be acquired by this department adjacent to the existing steam railroad location.

The plan contemplates the purchase from the Old Colony Railroad of the Shawmut Branch Railroad from Harrison square to Mattapan, with a terminus for high speed trains at Fields Corner, where a station is to be erected providing bodily transfer to surface cars for all points beyond.

The approval of this project by the legislature will initiate a new phase of transit development at a great reduction in cost, by the utilization of steam railroad locations for high speed lines in place of elevated structures, subways or tunnels.

#### SINKING FUNDS.

The following is the condition of the debt and of the sinking funds for the various divisions of the work of the department at the date of this report, as stated by the City Treasurer:

##### SUBWAY (INCLUDING ALTERATIONS).

(Debt, \$4,416,000, outside debt limit.)

Amount of fund, February 1, 1922 . . . . .	\$2,379,770	49
Interest on bank deposits, February 1, 1922, to date . . . . .	\$1,194	66
Interest on investments, February 1, 1922, to date . . . . .	91,470	00
<i>Carried forward</i> . . . . .	\$92,664	66
	\$2,379,770	49

<i>Brought forward</i> . . . . .	\$92,664 66	\$2,379,770 49
Revenue, etc., February 1, 1922 to date . . . . .	25,707 00	
Appreciation of investments, February 1, 1922, to date . . . . .	4,271 80	
		<u>122,643 46</u>
		\$2,502,413 95
Interest on investments purchased, February 1, 1922, to date . . . . .		606 66
		<u>\$2,501,807 29</u>

## CHARLESTOWN BRIDGE, No. 1.

*(Debt, \$750,000, inside debt limit.)*

Amount of fund, February 1, 1922 . . . . .		\$376,366 61
Interest on bank deposits, February 1, 1922, to date . . . . .	\$572 31	
Interest on investments, February 1, 1922, to date . . . . .	14,362 92	
Requirement for debt . . . . .	6,300 00	
		<u>21,235 23</u>
		<u>\$397,601 84</u>

## CHARLESTOWN BRIDGE, No. 2.

*(Debt, \$665,000, outside debt limit.)*

Amount of fund, February 1, 1922 . . . . .		\$414,066 71
Interest on bank deposits, February 1, 1922, to date . . . . .	\$496 89	
Interest on investments, February 1, 1922, to date . . . . .	17,016 25	
Revenue, etc., February 1, 1922 to date . . . . .	7,472 25	
		<u>24,985 39</u>
		<u>\$439,052 10</u>

## EAST BOSTON TUNNEL.

*(Debt, \$3,308,000, outside debt limit.)*

Amount of fund, February 1, 1922 . . . . .		\$1,383,539 76
Interest on bank deposits, February 1, 1922, to date . . . . .	\$1,099 43	
Interest on investments, February 1, 1922, to date . . . . .	52,042 92	
Requirement for debt . . . . .	15,254 00	
Revenue, etc., February 1, 1922, to date . . . . .	581 13	
Appreciation of investments, February 1, 1922, to date . . . . .	1,535 00	
		<u>70,512 48</u>
		\$1,454,052 24
Interest on investments purchased, February 1, 1922, to date . . . . .		690 28
		<u>\$1,453,361 96</u>

TRANSIT DEPARTMENT.

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BOSTON TUNNEL AND SUBWAY.

(Debt, \$8,418,700, outside debt limit.)

Amount of fund, February 1, 1922 . . . . .		\$2,181,058 13
Interest on bank deposits, February 1, 1922, to date . . . . .	\$1,449 95	
Interest on investments, February 1, 1922, to date . . . . .	89,657 26	
Revenue, etc., February 1, 1922, to date . . . . .	80,264 00	
Appreciation of investments, February 1, 1922, to date . . . . .	4,013 00	
		<u>175,384 21</u>
		\$2,356,442 34
Interest on investments purchased, February 1, 1922, to date . . . . .		1,518 62
		<u>\$2,354,923 72</u>

RAPID TRANSIT — CAMBRIDGE CONNECTION.

(Debt, \$1,520,000, outside debt limit.)

Amount of fund, February 1, 1922 . . . . .		\$195,174 17
Interest on bank deposits, February 1, 1922, to date . . . . .	\$606 92	
Interest on investments, February 1, 1922, to date . . . . .	7,796 87	
Revenue, etc., February 1, 1922, to date . . . . .	15,079 50	
		<u>23,483 29</u>
		<u>\$218,657 46</u>

BOYLSTON STREET SUBWAY.

(Debt, \$5,375,000, outside debt limit.)

Amount of fund, February 1, 1922 . . . . .		\$7,844 08
Interest on bank deposits, February 1, 1922, to date . . . . .	\$31 38	
Interest on investments, February 1, 1922, to date . . . . .	305 00	
Revenue, etc., February 1, 1922, to date . . . . .	500 00	
		<u>836 38</u>
		<u>\$8,680 46</u>

DORCHESTER TUNNEL.

(Debt, \$10,750,000, outside debt limit.)

Amount of fund, February 1, 1922 . . . . .		\$69,397 44
Interest on bank deposits, February 1, 1922, to date . . . . .	\$862 06	
Interest on investments, February 1, 1922, to date . . . . .	2,427 50	
Revenue, etc., February 1, 1922, to date . . . . .	20,779 63	
		<u>24,069 19</u>
		<u>\$93,466 63</u>

## ARLINGTON STATION.

*(Debt, \$1,230,000, outside debt limit.)*

## EAST BOSTON TUNNEL ALTERATIONS.

*(Debt, \$1,747,000, outside debt limit.)*

## EAST BOSTON TUNNEL EXTENSION.

*(Debt, \$2,450,000, outside debt limit.)*

Amount of fund, February 1, 1922 . . . . .		\$152,846 44
Interest on bank deposits, February 1, 1922, to date . . . . .	\$143 11	
Interest on investments, February 1, 1922, to date . . . . .	<u>5,843 75</u>	
		<u>5,986 86</u>
		<u>\$158,833 30</u>

## RENTAL BILLS RENDERED TO THE BOSTON ELEVATED RAILWAY COMPANY.

The following is a statement of the bills rendered for rental of the various tunnels and subways:

## TREMONT STREET SUBWAY.

Mar. 31, 1922:		
Net cost of subway . . . . .	\$4,101,938 70	
Rental for one quarter . . . . .		\$46,146 81
Alterations: net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
June 30, 1922:		
Net cost of subway . . . . .	4,101,938 70	
Rental for one quarter . . . . .		46,146 81
Alterations: net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
Sept. 30, 1922:		
Net cost of subway . . . . .	4,101,938 70	
Rental for one quarter . . . . .		46,146 81
Alterations: net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
Dec. 31, 1922:		
Net cost of subway . . . . .	4,101,938 70	
Rental for one quarter . . . . .		46,146 81
Alterations: net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
Total . . . . .		<u>\$195,507 56</u>

## WASHINGTON STREET TUNNEL.

Mar. 31, 1922:		
Net cost of tunnel . . . . .	\$7,926,076 84	
Rental for one quarter . . . . .		\$89,168 36
June 30, 1922:		
Net cost of tunnel . . . . .	7,926,076 84	
Rental for one quarter . . . . .		89,168 36
<i>Carried forward</i> . . . . .		<u>\$178,336 72</u>

TRANSIT DEPARTMENT.

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<i>Brought forward</i> . . . . .		\$178,336 72
Sept. 30, 1922:		
Net cost of tunnel . . . . .	7,926,076 84	
Rental for one quarter . . . . .		89,168 36
Dec. 31, 1922:		
Net cost of tunnel . . . . .	7,926,154 76	
Rental for one quarter . . . . .		89,169 24
	Total . . . . .	<u>\$356,674 32</u>

CAMBRIDGE CONNECTION.

Mar. 31, 1922:		
Net cost of connection . . . . .	\$1,490,748 72	
Rental for one quarter . . . . .		\$18,168 50
June 30, 1922:		
Net cost of connection . . . . .	1,508,663 07	
Rental for one quarter . . . . .		18,386 83
Sept. 30, 1922:		
Net cost of connection . . . . .	1,517,471 04	
Rental for one quarter . . . . .		18,494 18
Dec. 31, 1922:		
Net cost of connection . . . . .	1,518,634 80	
Rental for one quarter . . . . .		18,508 36
	Total . . . . .	<u>\$73,557 87</u>

BOYLSTON STREET SUBWAY.

Mar. 31, 1922:		
Net cost of subway . . . . .	\$5,193,706 99	
Rental for one quarter . . . . .		\$58,429 20
June 30, 1922:		
Net cost of subway . . . . .	5,194,303 06	
Rental for one quarter . . . . .		58,435 91
Sept. 30, 1922:		
Net cost of subway . . . . .	5,216,245 33	
Rental for one quarter . . . . .		58,682 76
Dec. 31, 1922:		
Net cost of subway . . . . .	5,224,909 48	
Rental for one quarter . . . . .		58,780 23
	Total . . . . .	<u>\$234,328 10</u>

EAST BOSTON TUNNEL EXTENSION.

Mar. 31, 1922:		
Net cost of extension . . . . .	\$2,240,205 56	
Rental for one quarter . . . . .		\$25,202 31
June 30, 1922:		
Net cost of extension . . . . .	2,240,205 56	
Rental for one quarter . . . . .		25,202 31
Sept. 30, 1922:		
Net cost of extension . . . . .	2,240,094 06	
Rental for one quarter . . . . .		25,201 06
Dec. 31, 1922:		
Net cost of extension . . . . .	2,240,094 06	
Rental for one quarter . . . . .		25,201 06
	Total . . . . .	<u>\$100,806 74</u>

## DORCHESTER TUNNEL.

Mar. 31, 1922:			
Net cost of tunnel . . . . .	\$10,736,734	34	
Rental for one quarter . . . . .			\$120,788 26
June 30, 1922:			
Net cost of tunnel . . . . .	10,739,049	44	
Rental for one quarter . . . . .			120,814 30
Sept. 30, 1922:			
Net cost of tunnel . . . . .	10,742,013	63	
Rental for one quarter . . . . .			120,847 65
Dec. 31, 1922:			
Net cost of tunnel . . . . .	10,752,349	35	
Rental for one quarter . . . . .			120,963 93
	Total . . . . .		<u>\$483,414 14</u>

## ARLINGTON STATION.

Mar. 31, 1922:			
Net cost of tunnel . . . . .	\$1,179,662	18	
Rental for one quarter . . . . .			\$13,271 20
June 30, 1922:			
Net cost of tunnel . . . . .	1,183,620	61	
Rental for one quarter . . . . .			13,315 73
Sept. 30, 1922:			
Net cost of tunnel . . . . .	1,208,378	27	
Rental for one quarter . . . . .			13,594 25
Dec. 31, 1922:			
Net cost of tunnel . . . . .	1,211,877	25	
Rental for one quarter . . . . .			13,633 62
	Total . . . . .		<u>\$53,814 80</u>

## EAST BOSTON TUNNEL.

June 30, 1922:			
Net cost of tunnel . . . . .	\$3,354,176	78	
Rental for one quarter . . . . .			\$8,684 10
Sept. 30, 1922:			
Net cost of tunnel . . . . .	3,354,690	91	
Rental for one quarter . . . . .			37,740 27
Dec. 31, 1922:			
Net cost of tunnel . . . . .	3,354,769	41	
Rental for one quarter . . . . .			37,741 15
	Total . . . . .		<u>\$84,165 52</u>

Grand Total . . . . . \$1,582,269 05

Tremont Street Subway . . . . .			\$195,507 56
Washington Street Tunnel . . . . .			356,674 32
Cambridge Connection . . . . .			73,557 87
Boylston Street Subway . . . . .			234,328 10
East Boston Tunnel Extension . . . . .			100,806 74
Dorchester Tunnel . . . . .			483,414 14
Arlington Station . . . . .			53,814 80
East Boston Tunnel . . . . .			84,165 52
	Total . . . . .		<u>\$1,582,269 05</u>

STATEMENT OF EXPENSES.

The following is a classified statement of the expenses of the department for the year ending January 31, 1923:

EAST BOSTON TUNNEL.

Engineering and miscellaneous:	
Labor . . . . .	\$1,594 52
Lighting . . . . .	81 15
Office supplies . . . . .	6 60
Skilled service . . . . .	163 00
Teaming . . . . .	3 75
	\$1,849 02

SECTION B.

Construction supplies . . . . .	\$421 80
Field supplies . . . . .	11 00
Labor . . . . .	349 40
Teaming . . . . .	6 46
	788 66

\$2,637 68

BOSTON TUNNEL AND SUBWAY.

SECTION 5.

Skilled service . . . . .	\$78 02
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\$78 02

CAMBRIDGE CONNECTION.

Office:	
Transferred from East Boston Tunnel Alterations account . . . . .	\$1,762 22
Engineering and miscellaneous:	
A. V. Day & Company (Contract 740) . . . . .	\$1,479 89
Galassi Mosaic and Tile Company (Contract 704) . . . . .	249 72
Advertising . . . . .	13 95
Chief Engineer . . . . .	275 00
Construction supplies . . . . .	2,760 73
Field supplies . . . . .	2,195 86
Fuel . . . . .	150 28
Instruments . . . . .	5 00
Labor . . . . .	21,612 61
Lighting . . . . .	2,169 39
Rental . . . . .	543 82
Skilled service . . . . .	2,591 15
Stationery — supplies . . . . .	34 21
Teaming . . . . .	1,251 28
Telephone — telegraph . . . . .	107 73
Tools . . . . .	1,083 85
Water pipes . . . . .	10 92
	36,535 39

\$38,297 61

DORCHESTER TUNNEL.

Office:	
Transferred from Arlington Station account . . . . .	\$190 45
Engineering and miscellaneous:	
Chief Engineer . . . . .	\$50 00
Lighting . . . . .	2 62
	\$52 62
Carried forward . . . . .	\$190 45

<i>Brought forward</i> . . . . .	\$52 62	\$190 45
Park Street Station enlarge- ment . . . . .	4,030 84	
Rental . . . . .	138 33	
Skilled service . . . . .	225 19	
Stationery — supplies . . . . .	3 15	
Telephone — telegraph . . . . .	4 56	
	<hr/>	
	\$4,454 69	
Credit:		
Stock . . . . .	692 45	
	<hr/>	
		3,762 24

SECTION D.

Construction supplies . . . . .	\$114 38	
Labor . . . . .	1,796 23	
Stationery — supplies . . . . .	25	
Teaming . . . . .	43 74	
	<hr/>	
		1,954 60

SECTION E.

Labor . . . . .	\$216 99	
Legal and expert advice . . . . .	50 00	
Printing . . . . .	9,710 11	
Skilled service . . . . .	1,039 25	
Stationery — supplies . . . . .	28 40	
Stenographers . . . . .	545 52	
	<hr/>	
		11,590 27

SECTION F.

Construction supplies . . . . .	\$13 45	
Field supplies . . . . .	30 00	
Stationery — supplies . . . . .	6 40	
	<hr/>	
		49 85

SECTION J.

Labor . . . . .	1,433 86	
	<hr/>	
		\$18,981 27

\$18,981 27

BOYLSTON STREET SUBWAY.

Office:		
Transferred from East Boston Tunnel		
Alterations account . . . . .		\$2,120 23
Engineering and miscellaneous:		
Chief Engineer . . . . .	\$250 00	
Construction supplies . . . . .	1,962 06	
Field supplies . . . . .	4,078 15	
Labor . . . . .	18,942 84	
Legal and expert advice . . . . .	200 00	
Lighting . . . . .	49 36	
Rental . . . . .	508 34	
Skilled service . . . . .	1,734 18	
Stationery — supplies . . . . .	36 35	
Teaming . . . . .	370 63	
Telephone — telegraph . . . . .	39 42	
Tools . . . . .	1,636 55	
	<hr/>	
		29,807 88
<i>Carried forward</i> . . . . .		\$31,928 11

*Brought forward* . . . . . \$31,928 11

SECTION 1.

Stationery — supplies . . . . . 6 40

SECTION 2.

Galassi Mosaic and Tile Company (Contract 700) . . . . . 164 59

\$32,099 10

EAST BOSTON TUNNEL EXTENSION.

SECTION J.

Property damages: takings (credit) . . . . . \$2,754 00

\$2,754 00

ARLINGTON STATION.

Office:

Transferred from East Boston Tunnel Alterations account . . . . . \$1,762 17

Engineering and miscellaneous:

Chief Engineer . . . . . \$275 00  
 Lighting . . . . . 12 04  
 Rental . . . . . 327 11  
 Skilled service . . . . . 853 62  
 Stationery — supplies . . . . . 21 70  
 Stenographers . . . . . 16 25  
 Telephone — telegraph . . . . . 26 66

1,532 38

Construction:

Hugh Nawn Contracting Company (Contract 687) . . . . . \$7,221 00  
 B. E. Grant Company (Contract 750) . . . . . 13,360 24  
 Advertising . . . . . 7 65  
 Inspection . . . . . 156 00  
 Labor . . . . . 4,563 29  
 Lighting . . . . . 889 55  
 Paving . . . . . 2,817 26  
 Rental . . . . . 350 00  
 Teaming . . . . . 170 37  
 Telephone — telegraph . . . . . 3 09

\$29,538 45

Credit:

Waldo Bros. & Bond Company (Contract 709) . . . . . \$5,271 55

Construction supplies . . . . . 12,369 89  
 Field supplies . . . . . 317 78  
 Fuel . . . . . 15 65  
 Tools . . . . . 90 04

18,064 91

11,473 54

Extension:

Hugh Nawn Contracting Company (Contract 687) . . . . . \$102 71  
 Waldo Bros. & Bond Company (Contract 709) . . . . . 6,024 62

*Carried forward* . . . . . \$6,127 33 \$14,768 09

<i>Brought forward</i> . . . . .	\$6,127 33	\$14,768 09	
B. E. Grant Company (Contract 750) . . . . .	13,360 25		
Advertising . . . . .	7 65		
Field supplies . . . . .	13 69		
Inspection . . . . .	156 00		
Labor . . . . .	589 09		
Lighting . . . . .	845 94		
Paving . . . . .	1,177 58		
Skilled service . . . . .	232 40		
Stationery — supplies . . . . .	2 30		
Stenographers . . . . .	16 25		
Teaming . . . . .	102 19		
	<hr/>		
	\$22,630 67		
Credit:			
Construction supplies . . . . .	5,634 02		
	<hr/>		
		16,996 65	
Interest . . . . .		10,332 10	
		<hr/>	
			<u>\$42,096 84</u>

## EAST BOSTON TUNNEL ALTERATIONS.

Office:			
Furniture . . . . .	\$291 43		
Lighting . . . . .	212 52		
Printing . . . . .	456 70		
Rental . . . . .	6,021 25		
Repairs . . . . .	1,499 69		
Stationery — supplies . . . . .	2,714 60		
Telephone — telegraph . . . . .	1,731 38		
Office boy . . . . .	699 18		
Stenographers . . . . .	4,602 93		
Assistant Secretary and Chief Clerk . . . . .	2,692 56		
Commissioners and Secretary,	19,578 87		
	<hr/>		
	\$40,501 11		
Transferred to Arlington Station Account . . . . .	\$1,762 17		
Transferred to Dorchester Tunnel Account . . . . .	190 45		
Transferred to Cambridge Connection Account . . . . .	1,762 22		
Transferred to Boylston Street Subway Account . . . . .	2,120 23		
	<hr/>		
	5,835 07		
	<hr/>		
		\$34,666 04	
Engineering and miscellaneous:			
Chief Engineer . . . . .	\$5,100 00		
Clerks . . . . .	6,881 07		
Furniture . . . . .	41 61		
Instruments . . . . .	38 55		
Lighting . . . . .	168 83		
Printing . . . . .	882 97		
Rental . . . . .	5,053 67		
Repairs . . . . .	1,088 65		
Skilled service . . . . .	36,243 75		
	<hr/>		
<i>Carried forward</i> . . . . .	\$55,499 10	\$34,666 04	

<i>Brought forward</i> . . . . .	\$55,499 10	\$34,666 04
Stationery — supplies . . . . .	5,745 61	
Stenographers . . . . .	5,065 19	
Telephone — telegraph . . . . .	534 68	
Devonshire Station Changes:		
Skilled service . . . . .	1,935 46	
Stationery — supplies . . . . .	18 47	
	—————	68,798 51
Construction:		
Advertising . . . . .	\$175 95	
Alterations . . . . .	4,527 57	
Construction supplies . . . . .	236,900 04	
Damages . . . . .	25 00	
Field supplies . . . . .	122,498 50	
Fuel . . . . .	6,426 62	
Inspection . . . . .	534 38	
Instruments . . . . .	137 25	
Labor . . . . .	846,179 93	
Legal and expert advice . . . . .	567 03	
Lighting . . . . .	12,501 35	
Printing . . . . .	322 85	
Rental . . . . .	10,481 60	
Teaming . . . . .	101,542 55	
Telephone — telegraph . . . . .	61 83	
Tools . . . . .	83,768 57	
Underpinning . . . . .	395 16	
Water pipes . . . . .	1,781 44	
Devonshire Station Changes:		
Construction . . . . .	1,408 21	
Field supplies . . . . .	1,938 38	
Fuel . . . . .	68 59	
Inspection . . . . .	6 64	
Labor . . . . .	12,118 90	
Lighting . . . . .	383 73	
Teaming . . . . .	934 59	
Telephone — telegraph . . . . .	4 17	
Tools . . . . .	786 26	
Water pipes . . . . .	18 13	
	—————	1,446,495 22
		—————
		\$1,549,959 77
Interest (credit) . . . . .		17 36
		—————
		<u>\$1,549,942 41</u>
Increase:		
East Boston Tunnel . . . . .	\$2,637 68	
Boston Tunnel and Subway . . . . .	78 02	
Cambridge Connection . . . . .	38,297 61	
Dorchester Tunnel . . . . .	18,981 27	
Boylston Street Subway . . . . .	32,099 10	
Arlington Station . . . . .	42,096 84	
East Boston Tunnel Alterations . . . . .	1,549,942 41	
	—————	
	\$1,684,132 93	
Decrease:		
East Boston Tunnel Extension . . . . .	2,754 00	
	—————	
Net Increase . . . . .		<u>\$1,681,378 93</u>

## SUMMARY.

	From beginning of work to Jan. 31, 1922.	Jan. 31, 1922, to Jan. 31, 1923.	Total.
Subway—Subway Commis- sion . . . . .	\$14,131 16		\$14,131 16
Part of General Expenses, Engineering and miscel- laneous . . . . .	117,550 71		117,550 71
Section One . . . . .	407,475 48		407,475 48
Two . . . . .	239,407 12		239,407 12
Three . . . . .	363,605 50		363,605 50
Section Three and one- half . . . . .	300,639 36		300,639 36
Four . . . . .	9,355 70		9,355 70
Five . . . . .	472,147 31		472,147 31
Six . . . . .	387,411 49		387,411 49
Seven . . . . .	327,541 86		327,541 86
Eight . . . . .	231,504 27		231,504 27
Eight and one- half . . . . .	95,902 06		95,902 06
Nine . . . . .	76,639 47		76,639 47
Ten . . . . .	299,452 07		299,452 07
Eleven . . . . .	254,497 88		254,497 88
Interest . . . . .	270,310 57		270,310 57
	258,575 60		258,575 60
	<u>\$4,126,147 61</u>		<u>\$4,126,147 61</u>
Transfers to Alterations, see 11th report . . . . .	4 95		4 95
	<u>\$4,126,142 66</u>		<u>\$4,126,142 66</u>
Alterations—Part of Gen- eral Expenses . . . . .	\$28,945 53		\$28,945 53
Section Three . . . . .	2,568 26		2,568 26
Four . . . . .	163 42		163 42
Five . . . . .	30,233 01		30,233 01
Seven . . . . .	178,516 16		178,516 16
Nine . . . . .	3 00		3 00
Ten . . . . .	534 04		534 04
Interest . . . . .	1,905 56		1,905 56
Transfer from Subway, see 11th report . . . . .	4 95		4 95
	<u>\$242,873 93</u>		<u>\$242,873 93</u>
Charlestown Bridge: Total . . . . .	<u>\$1,570,197 98</u>		<u>\$1,570,197 98</u>
Investigation of Congestion of Traffic, etc. . . . .	<u>\$3,015 92</u>		<u>\$3,015 92</u>
East Boston Tunnel—Part of General Expenses . . . . .	\$161,134 78		\$161,134 78
Engineering and miscel- laneous . . . . .	197,643 56	\$1,849 02	199,492 58
Section A . . . . .	98,869 09		98,869 09
B . . . . .	1,459,630 73	788 66	1,460,419 39
C . . . . .	508,202 77		508,202 77
D . . . . .	246,569 26		246,569 26
E . . . . .	188,303 27		188,303 27
F . . . . .	243,686 10		243,686 10
Interest . . . . .	248,156 88		248,156 88
	<u>\$3,352,196 44</u>	<u>\$2,637 68</u>	<u>\$3,354,834 12</u>

	From beginning of work to Jan. 31, 1922.	Jan. 31, 1922, to Jan. 31, 1923.	Total.
Boston Tunnel & Subway — Part of General Ex- penses . . . . .	\$226,547 21		\$226,547 21
Engineering and miscel- laneous . . . . .	419,450 55		419,450 55
Section One . . . . .	815,586 82		815,586 82
Two . . . . .	614,156 25		614,156 25
Three . . . . .	683,832 90		683,832 90
Four . . . . .	1,205,244 49		1,205,244 49
Five . . . . .	1,080,023 84	\$78 02	1,080,101 86
Six . . . . .	334,530 37		334,530 37
Seven . . . . .	139,723 14		139,723 14
Eight . . . . .	617,152 07		617,152 07
Nine . . . . .	678,714 43		678,714 43
Ten . . . . .	142,835 42		142,835 42
Eleven . . . . .	345,493 91		345,493 91
Twelve . . . . .	45,417 52		45,417 52
Interest . . . . .	648,179 81		648,179 81
	<u>\$7,996,888 73</u>	<u>\$78 02</u>	<u>\$7,996,966 75</u>
Cambridge Connection — Part of General Ex- penses . . . . .	\$62,740 15	\$1,762 22	\$64,502 37
Engineering and miscel- laneous . . . . .	106,468 49	36,535 39	143,003 88
Section One . . . . .	590,277 28		590,277 28
Two . . . . .	637,416 37		637,416 37
Interest . . . . .	76,722 00		76,722 00
	<u>\$1,473,624 29</u>	<u>\$38,297 61</u>	<u>\$1,511,921 90</u>
Dorchester Tunnel — Part of General Expenses . . . . .	\$196,371 09	\$190 45	\$196,561 54
Engineering and miscel- laneous . . . . .	828,930 05	3,762 24	832,692 29
Section A . . . . .	409,381 71		409,381 71
B . . . . .	876,613 35		876,613 35
C . . . . .	458,816 18		458,816 18
D . . . . .	1,114,244 18	1,954 60	1,116,198 78
E . . . . .	2,327,351 58	11,590 27	2,338,941 85
F . . . . .	860,227 84	49 85	860,277 69
G . . . . .	616,147 82		616,147 82
H . . . . .	892,879 48		892,879 48
J . . . . .	949,919 26	1,433 86	951,353 12
Interest . . . . .	1,312,320 20		1,312,320 20
	<u>\$10,843,202 74</u>	<u>\$18,981 27</u>	<u>\$10,862,184 01</u>
Boylston Street Subway — Part of General Ex- penses . . . . .	\$102,010 30	\$2,120 23	\$104,130 53
Engineering and miscel- laneous . . . . .	209,411 52	29,807 88	239,219 40
Section One . . . . .	756,763 21	6 40	756,769 61
Two . . . . .	1,215,541 26	164 59	1,215,705 85
Three . . . . .	585,416 58		585,416 58
Four . . . . .	1,457,386 83		1,457,386 83
Five . . . . .	729,105 29		729,105 29
Interest . . . . .	320,194 59		320,194 59
	<u>\$5,375,829 58</u>	<u>\$32,099 10</u>	<u>\$5,407,928 68</u>

	From beginning of work to Jan. 31, 1922.	Jan. 31, 1922 to Jan. 31, 1923.	Total.
East Boston Tunnel Extension — Part of General Expenses . . . . .	\$33,639 30		\$33,639 30
Engineering and miscellaneous . . . . .	974,131 55		974,131 55
Section G . . . . .	289,575 11		289,575 11
H . . . . .	627,059 41		627,059 41
J . . . . .	140,712 58	* \$2,754 00	137,958 58
Interest . . . . .	224,138 91		224,138 91
	<u>\$2,289,256 86</u>	<u>* \$2,754 00</u>	<u>\$2,286,502 86</u>
Arlington Station — Part of General Expenses . . . . .	\$39,551 09	\$1,762 17	\$41,313 26
Engineering and miscellaneous . . . . .	71,444 07	1,532 38	72,976 45
Construction . . . . .	564,560 35	11,473 54	576,033 89
Extension . . . . .	464,954 89	16,996 65	481,951 54
Interest . . . . .	45,406 58	10,332 10	55,738 68
	<u>\$1,185,916 98</u>	<u>\$42,096 84</u>	<u>\$1,228,013 82</u>
East Boston Tunnel Alterations — Part of General Expenses . . . . .	\$4,121 76	\$34,666 04	\$38,787 80
Engineering and miscellaneous . . . . .	24,954 34	68,798 51	93,752 85
Construction . . . . .	116,139 67	1,446,495 22	1,562,634 89
Interest . . . . .		* 17 36	* 17 36
	<u>\$145,215 77</u>	<u>\$1,549,942 41</u>	<u>\$1,695,158 18</u>
Chapter 78 — Resolves of 1913 . . . . .	<u>\$389 14</u>		<u>\$389 14</u>
Chapter 84 — Resolves of 1913 . . . . .	<u>\$636 58</u>		<u>\$636 58</u>
Dorchester Tunnel Extension . . . . .	<u>\$520 19</u>		<u>\$520 19</u>
Grand Totals . . . . .	<u>\$38,605,907 79</u>	<u>\$1,681,378 93</u>	<u>\$40,287,286 72</u>

\* Decrease.

The report of the Chief Engineer follows.

THOMAS F. SULLIVAN,  
FRANCIS E. SLATTERY,  
LOUIS K. ROURKE,  
*Commissioners.*

## REPORT OF CHIEF ENGINEER.

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BOSTON, January 31, 1923.

THOMAS F. SULLIVAN, FRANCIS E. SLATTERY AND LOUIS K. ROURKE, *Commissioners, City of Boston — Transit Department.*

GENTLEMEN,— I herewith submit a report for the year ending January 31, 1923.

The engineering work of the department during the last year has been of a more varied nature than in the years preceding, principally on account of taking over a large amount of the actual construction work which has usually been let out by contract. The amount of detail office engineering work has consequently greatly increased, as this construction work has involved the design and plans for equipment, temporary supports for buildings and subway structures, underpinning, etc., as well as the layouts, design and detail plans of the new structures, also estimates and orders for all materials.

The designs and plans have been made under the direction of Assistant Engineer Leonard B. Howe, and the construction work has been carried on in the following places:

East Boston Tunnel Alterations, Maverick square.

East Boston Tunnel Alterations, Extension of Devonshire Station.

Cambridge Connection, Enlargement of platform and stairway, Park street under.

Lowering platforms at Haymarket square, Adams square and Boylston street stations of the Tremont street subway.

Column changes, Scollay square station.

Arlington Station, Permanent repaving in Arlington and Boylston streets.

### EAST BOSTON TUNNEL ALTERATIONS.

The engineering and construction work in Maverick square and Lewis street was continued during the month of February along the lines described in the last annual report. Early in March, however, preparations were made to carry on the work on a much larger scale by adding greatly to the working force and equipment.

The number of men was increased during the month from about 200 to 600. During the succeeding months this force was further increased until a maximum of 895 men was reached in October.

All of the men employed were obtained from the State Civil Service list and about 85 per cent of the men were veterans. The work of subway construction, involving, as it does, deep excavation, bridging, bracing, waterproofing, bending and placing rods, erecting structural steel, concreting, etc., was in most cases new to the majority of the men, but working under experienced foremen, the men with but few exceptions showed a willingness to do heavy work and ability to quickly grasp the various steps in this type of construction.

The storage yard, temporary buildings and plant were described in the previous report. The number of temporary buildings, however, has been increased as the job has expanded. A tool house was erected on Emmons street. A machine shop, equipped with lathe, drill press, etc., was erected on the mound over the tunnel in Maverick square, as was also a men's house containing two large rooms for the men and a room for the foremen. A central time office was attached to this building, through which all of the men were required to check in and out. The men's house is shown on Plate 1.

The equipment was increased by the addition of sixteen large wagon derricks (eight electric and eight steam), ten dirt hoppers, a 400-foot cableway, a number of electric, gas and steam pumps, also pneumatic hammers, concrete breakers, drills and clay diggers. A 20-ton platform scale was placed in Sumner street for the weighing of all crushed stone, sand and other materials as delivered. Six of the electric derricks were designed and built by the Department at a considerable saving in time and money.

The general layout of the whole work was such that it could be divided into three divisions, each of a different type of construction. These divisions were located as follows; Chelsea street, Maverick square and Lewis street.

The Chelsea street division was a double-track subway built of reinforced concrete sidewalls and invert and having a flat slab concrete roof supported on steel cross beams.

The Maverick square division consisted of two sections and a loop of single-track subway entirely of reinforced concrete.

The Lewis street division was an underground 4-track station

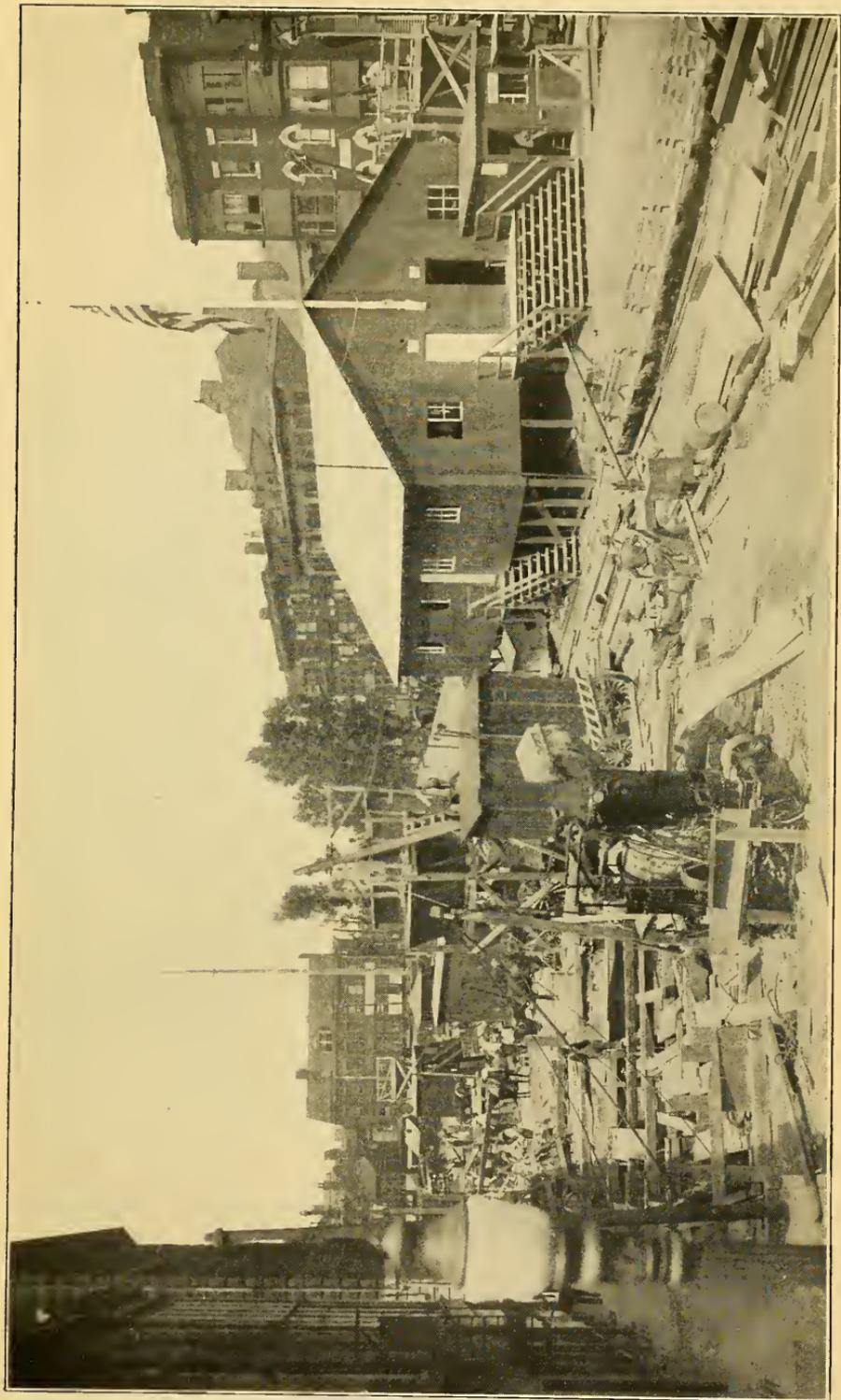


PLATE 1.—MEN'S HOUSE, TIME OFFICE AND GENERAL VIEW — MAVERICK SQUARE





PLATE 2.—TRENCH FOR EAST WALL OF SUBWAY — CHELSEA STREET



with single-track loop beyond. The station, constructed in part under large buildings on each side of the street, was designed of heavy steel and reinforced concrete in order not only to carry the present buildings but to support buildings of a much heavier type in the future.

#### CHELSEA STREET.

Construction on the Chelsea street division was started by first excavating for the sidewalls in deep narrow trenches, with provision for the construction of new sewer, water and gas mains outside of these walls. As the old sewer and other pipes were located in the centre of the street, which space was to be occupied by the new subway when constructed, it was therefore necessary to relocate the pipes on both sides of the street. The side trenches were carried down, leaving the center of the street, or a core about 18 feet wide, to be removed later.

Four-inch tongued and grooved sheeting was driven on the sides next to the buildings and 2-inch spruce poling boards in short lengths were used on the sides next to the core. The tongued and grooved sheeting was left in place and provided a vertical surface on which the waterproofing was applied. The poling boards were removed during the excavation of the core, which required no bracing, as the walls were at that time in place and were held by an occasional strut or a roof beam.

Great care was taken in bracing the side trenches in order to prevent settlement of the brick buildings on each side of the street, as the trenches, which were about 28 feet in depth, were much deeper than the foundations of the nearby buildings.

The soil consisted of about seven feet of fill on top of the original marsh land, next a layer of peat varying from one to six feet thick, then a layer of soft light-blue clay. This clay became darker in color and stiffer as the depth increased, and at the bottom of the trench was a hard blue clay.

The work was carried on without settlement to any of the buildings although on several occasions the trenches were flooded by the backing up of the old sewer during a heavy storm and high tide. Plate 2 shows the easterly trench and method of bracing.

After the trenches were completed and the reinforced concrete walls, concrete sewers and other pipes placed, the work of removing the remainder of the earth, or core, in the centre

of the street was started and carried down by means of the cableway. Plate 3 shows this work in progress.

The excavation of the core was carried down (removing the old sewers, water, gas and service pipes), the invert built and the steel roof beams placed, after which the concrete flat slab roof was poured. The beams were 30 inches in depth, about  $31\frac{1}{2}$  feet long and weighed about three tons each. Plate 4 shows the method of placing them with the cableway.

At the northerly end of this section a machine shop is being built in the subway, having two floors, one being the invert of the subway and the other a mezzanine floor, each about 30 by 30 feet. A stairway and elevator shaft have been built under the westerly sidewalk to connect with both floors.

Inspection car pits, about 200 feet in length, have been built in the invert, as it is intended to use this section of the subway for storage and repair of the new steel tunnel cars until such time as the subway is extended up Chelsea street.

#### MAVERICK STREET.

The method of carrying on the work in the Maverick square division on the west side was described in detail in the last report, and the same method was used in the construction work on the east side of Maverick square where the street was first bridged and a number of sections were worked simultaneously.

Plate 5 shows method of carrying down the excavation. Plate 6 shows typical roof reinforcing in place. Plate 7 shows a typical finished section of subway in Maverick square.

#### LEWIS STREET.

The Lewis street division, or station proper, was the last to be started, on account of its location, which, as above stated, was partly under heavy buildings. This made it more inaccessible than the other sections of the work, and a large amount of detail work was involved in preparing plans for the temporary support of the buildings, making real estate takings, designing the underpinning and permanent structure and ordering the structural steel and other material before proceeding with the actual work. The construction has been carried on with as little inconvenience to the occupants of the different buildings as possible.

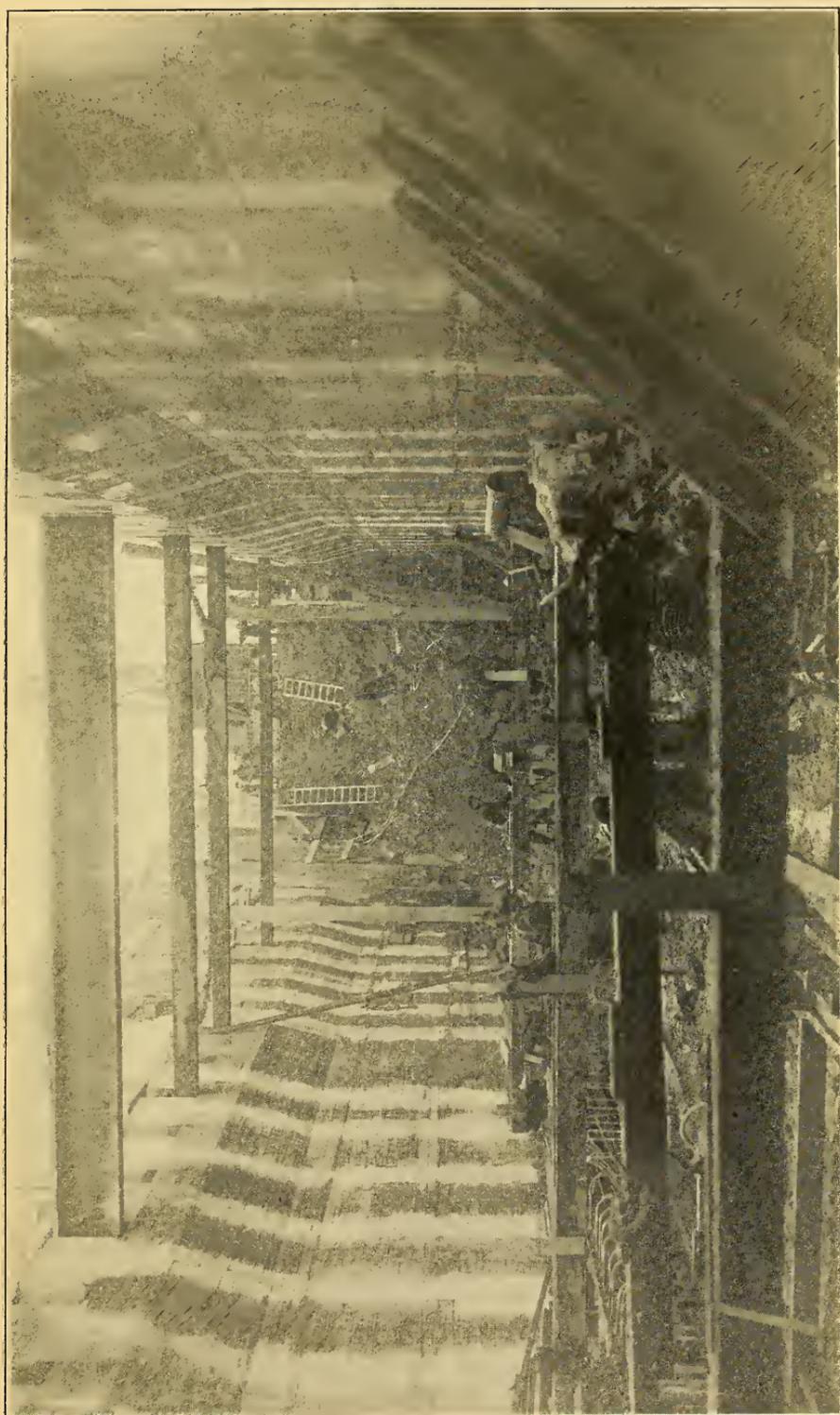


PLATE 3.—REMOVAL OF EARTH CORE BETWEEN COMPLETED SUBWAY WALLS — CHELSEA STREET



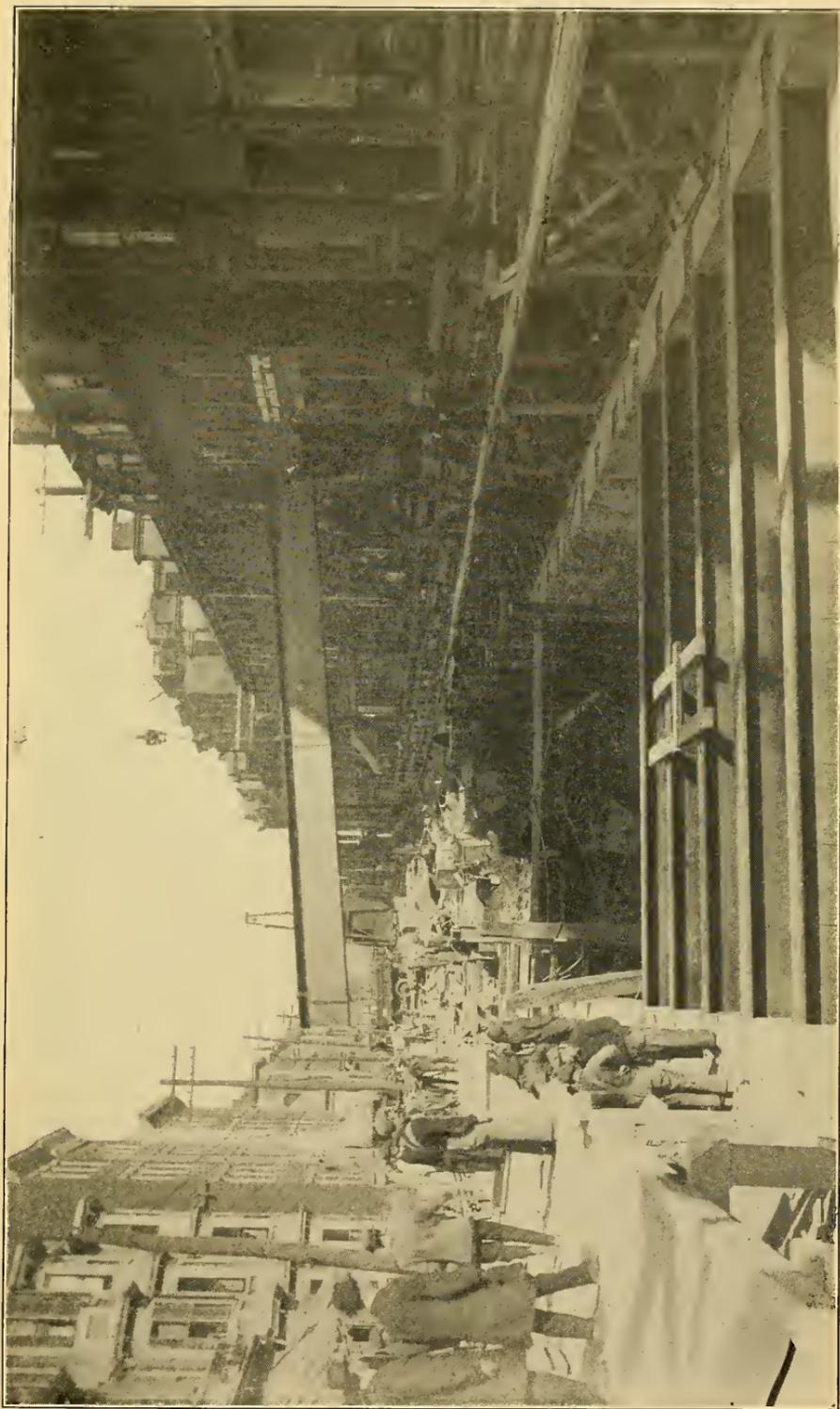


PLATE 4.—PLACING ROOF BEAMS OF SUBWAY — CHELSEA STREET



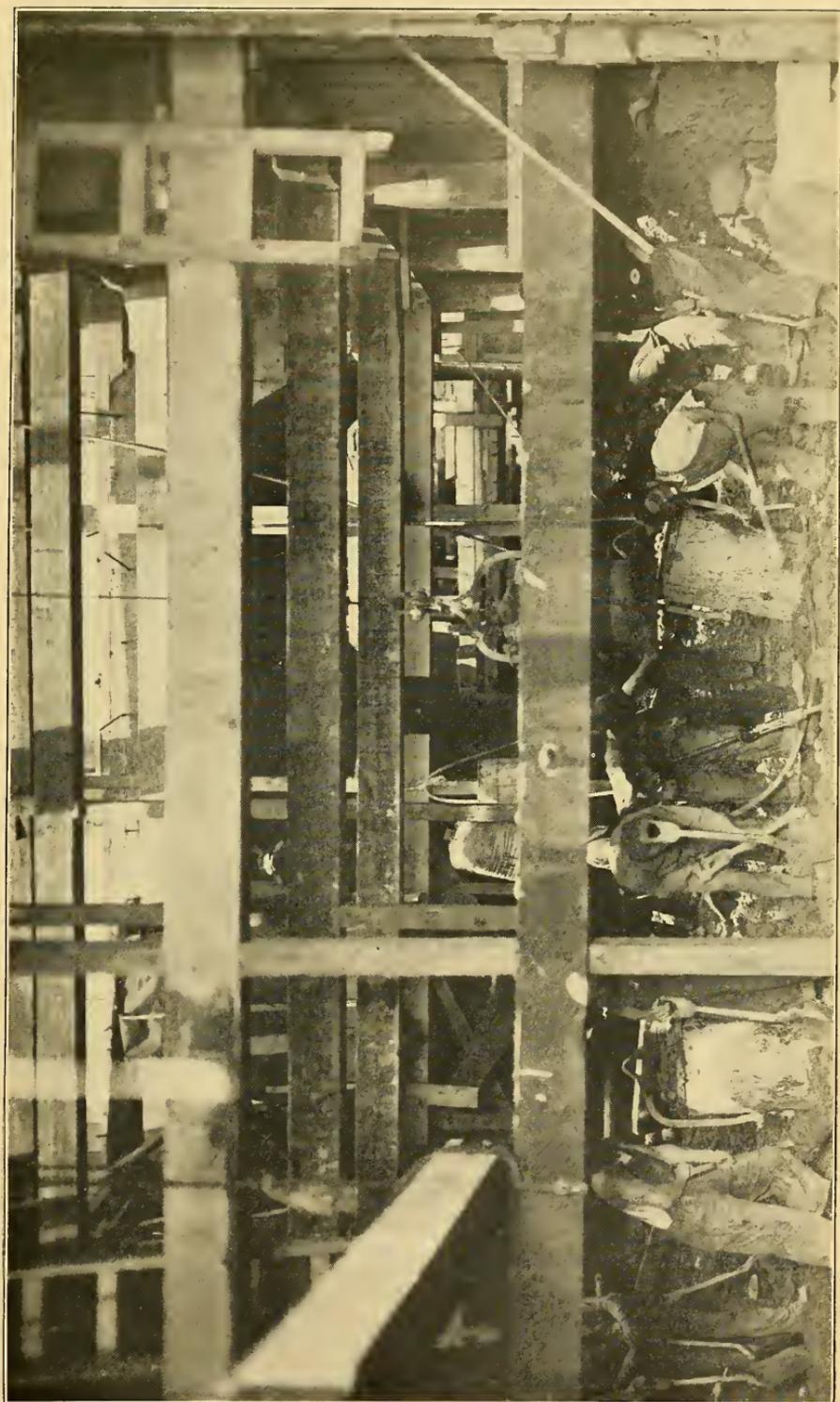


PLATE 5.—EXCAVATION WORK — MAVERICK SQUARE



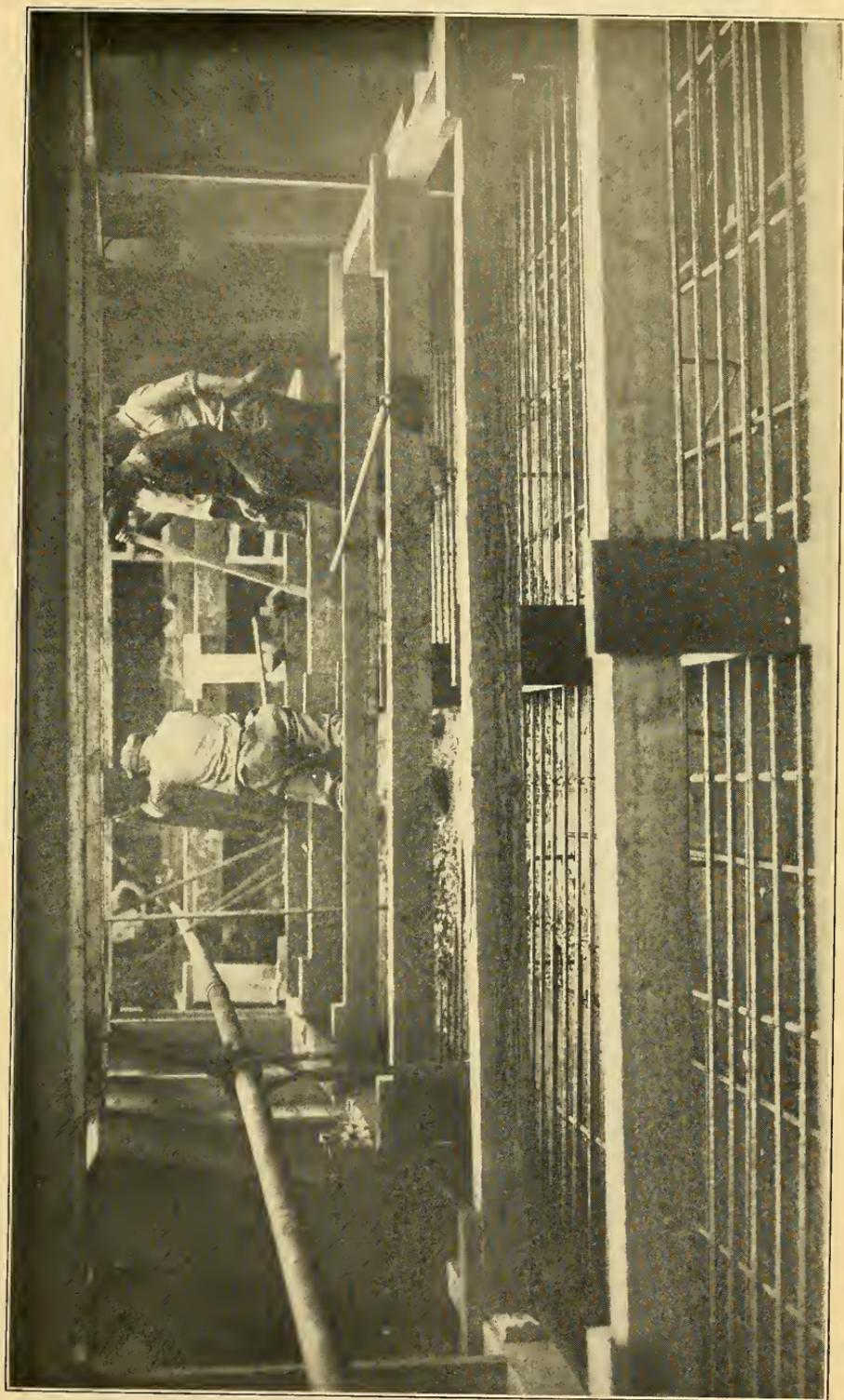


PLATE 6.—REINFORCING RODS IN ROOF OF SUBWAY — MAVERICK SQUARE



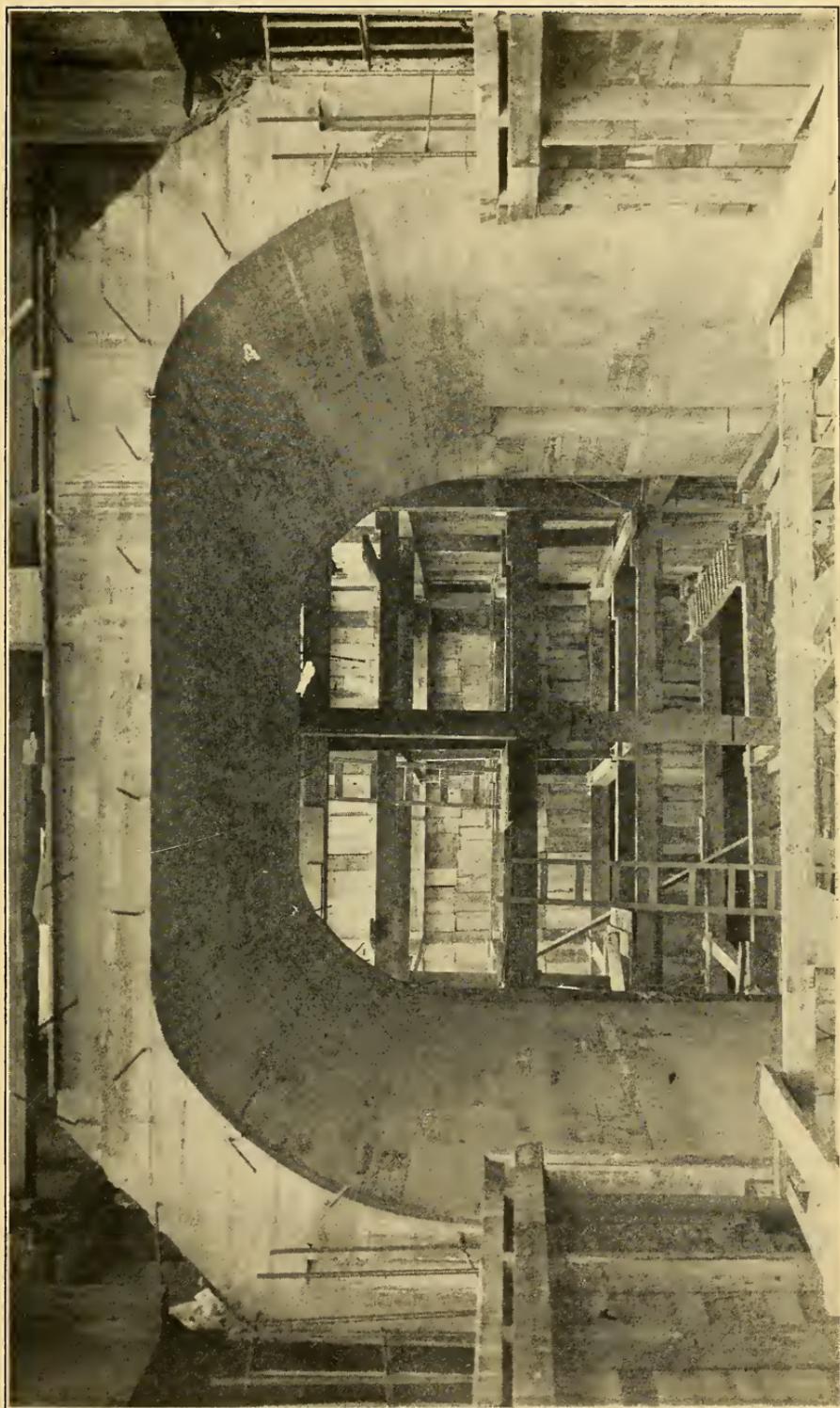


PLATE 7.—TYPICAL SUBWAY SECTION — MAVERICK SQUARE



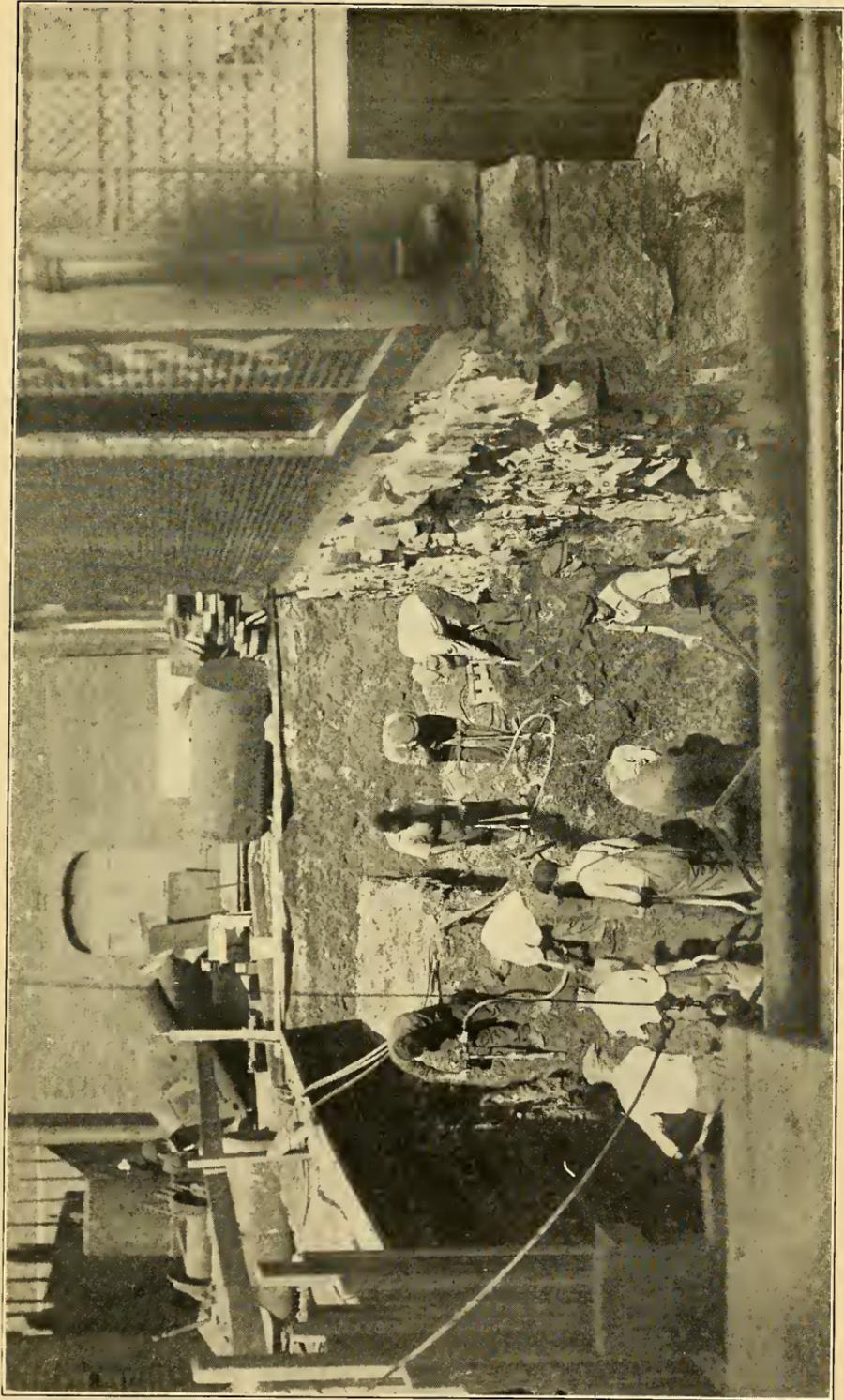


PLATE 8.—EXCAVATING WITH PNEUMATIC CLAY DIGGERS — LEWIS STREET



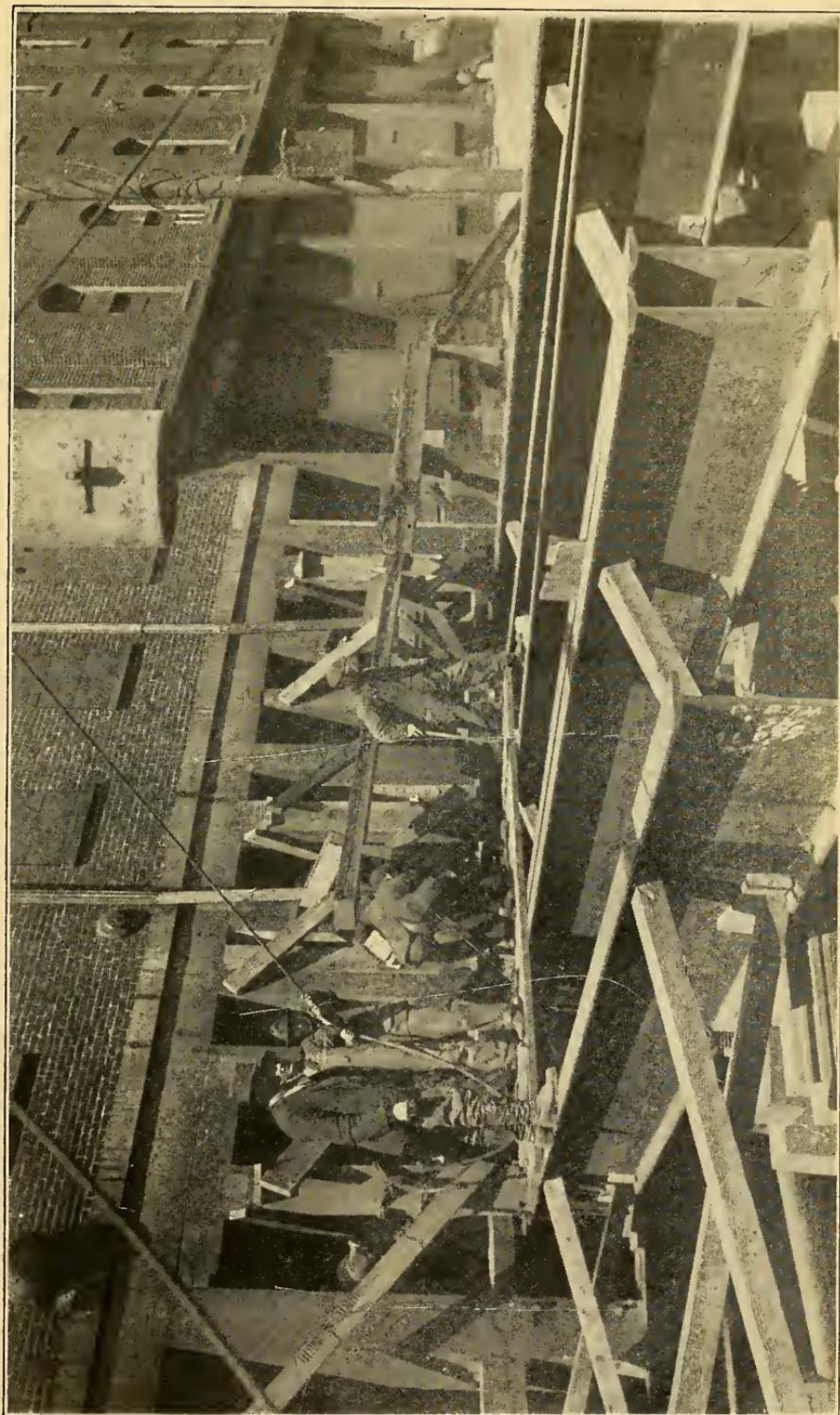


PLATE 9.--TEMPORARY SUPPORT FOR BUILDINGS — LEWIS STREET



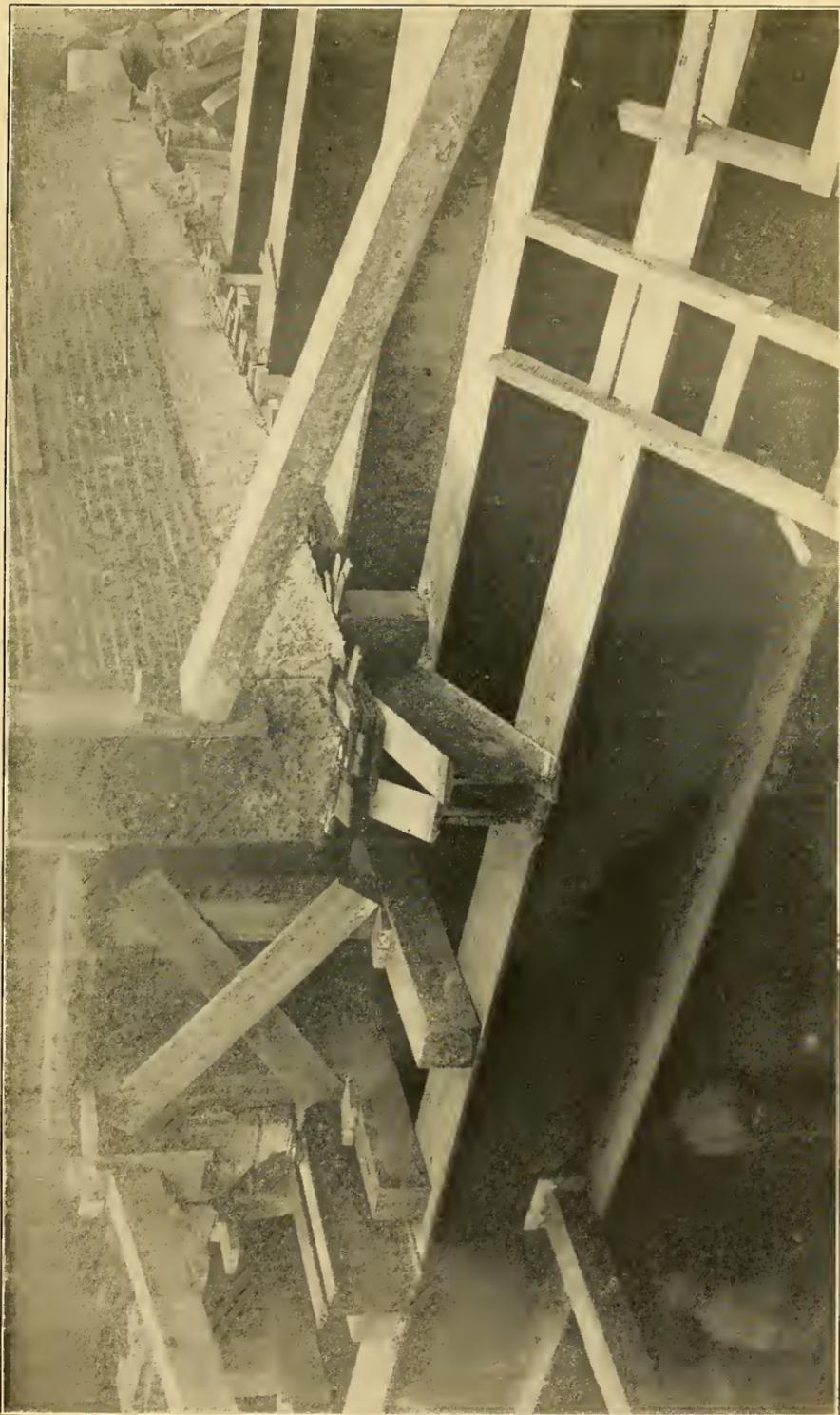


PLATE 10.—TEMPORARY SUPPORT FOR BUILDINGS.—LEWIS STREET.



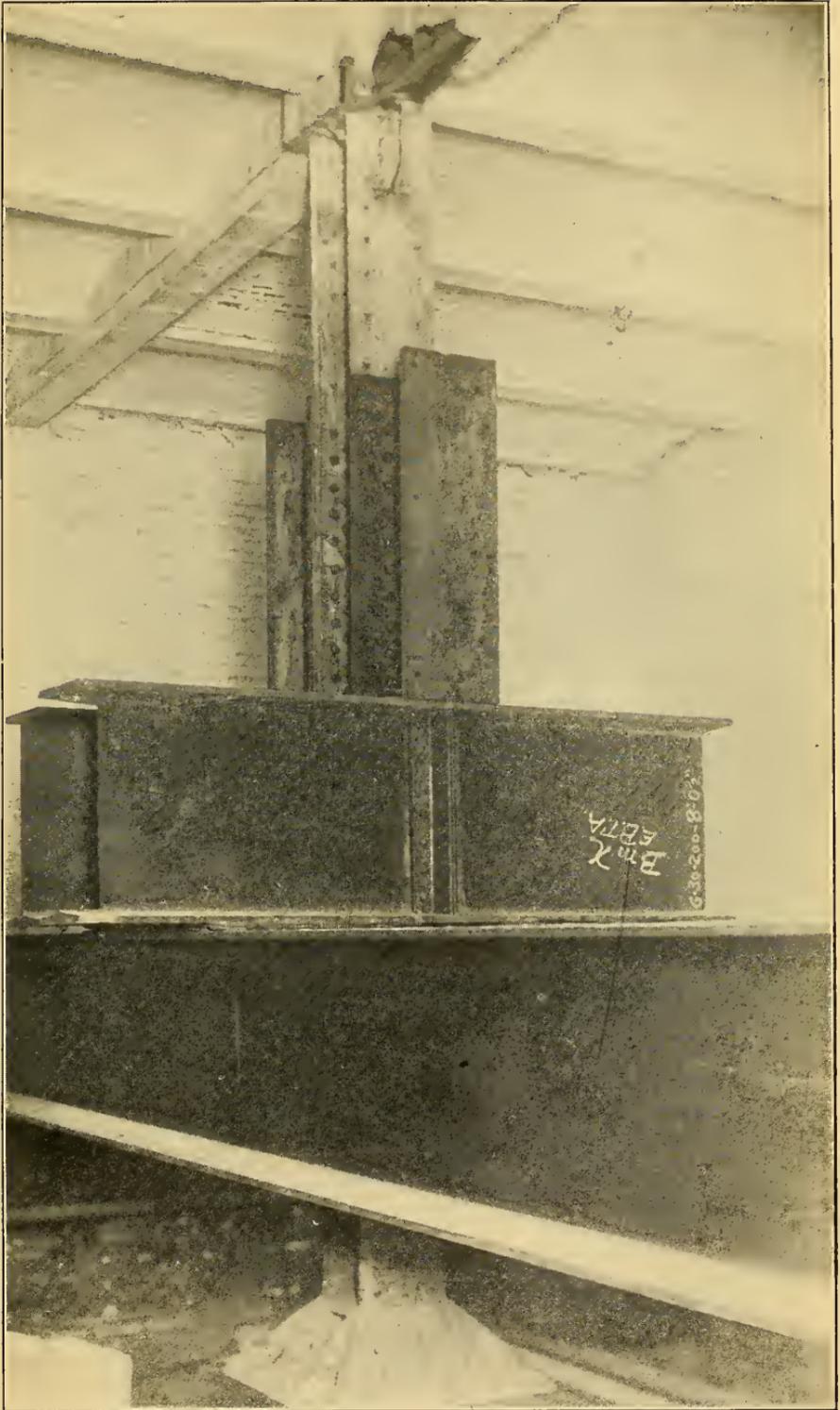


PLATE 11.—TEMPORARY SUPPORT OF 300 TON COLUMN IN BUILDING.  
—LEWIS STREET.



The buildings on Lewis street vary considerably in the type of construction but practically all the buildings on both sides of the street between Sumner street and Marginal street had to be temporarily supported.

The buildings on the east side of Lewis street were very heavy warehouses with walls and inside columns that were to rest on the station roof. Special methods were used for supporting these walls and columns while the old foundations were removed.

On the west side the buildings were older but less substantially constructed, one being of the old wooden type. Great care was necessary to avoid settling these structures.

The temporary underpinning beams were so designed, and ordered in such lengths, that after their use for temporary underpinning they were fabricated in our Cypher-street shop into columns, girders and beams to be used in the permanent construction of the station. Part of this work has already been done and the permanent steel placed as planned.

The method followed on this work was in general as follows: After a permanent taking was made a temporary taking of occupation was made of such space above ground as was needed to carry on the work. Tight wooden partitions were then erected in the portions of the buildings to be occupied and the work of cutting out the foundation walls and supporting the buildings on steel beams and blocking was started. The slice method was used, as it involved supporting and underpinning only portions of a building at one time. These slices were generally started at the corners of the buildings, and after the buildings were caught up, the excavation was carried down in the manner previously described. Pneumatic clay diggers were used on this as on all other sections of the work and were found to be very advantageous in excavating in congested places under the buildings. Plate 8 shows three of these pneumatic diggers in use.

After the excavation was completed a section of the subway station was built, and that portion of the building supported was pinned down upon the new subway roof.

Plates 9 and 10 show different types of temporary support of buildings on Lewis street. Plate 11 shows method of supporting a 300-ton column while the old column foundation is being removed.

The portion of the station under the buildings is still in process of construction. The work has been carried on with consider-

able difficulty during the last two months by reason of extremely cold weather and repeated accumulations of snow and ice in the bottoms of the excavations.

A portion of the concrete ventilating chamber of the old tunnel on Lewis street was removed, and this was done by drilling during the day time and blasting with light charges of dynamite during the night time between the hours of 1 and 5 a. m. when but one track of the tunnel was being used. This method will be followed in removing about 520 feet of the old tunnel in the centre of Lewis street after the side track portions of the station are completed under the buildings.

The excavated earth, foundation stone, broken concrete and other materials taken from the work, were, as in the previous year, handled by teams and trucks furnished by Edward J. McHugh & Son.

At this time about 75 per cent of the excavation and about 60 per cent of the entire work is completed.

The work has been carried on under the direction of Assistant Chief Engineer Wilbur W. Davis.

#### EXTENSION OF DEVONSHIRE STATION.

At the request of the Boston Elevated Railway Company the platforms of the Devonshire station are being lengthened on the easterly end a distance of thirty feet. The actual work of excavation was begun in front of 53 State street on September 6, 1922. At the date of this report the new wall and sewer have been built on the southerly side and the excavation on the northerly side has been nearly completed. The excavation on the northerly side has been done with care in short stretches, as the bottom of the digging is about six feet below the foundation of the adjacent building. A new sewer is also being laid on this side. The work will require the cutting out and removing of the old walls and roof of the tunnel. The new walls are being built of reinforced concrete but the roof will have 30-inch steel beams, generally four feet on centres, in place of the old reinforced concrete construction.

Extensive changes have been made by the various companies controlling the conduits in the street, and the water pipes and gas pipes will be relocated as the work progresses.

The work of building the extension is being done by this department with its own men.

Assistant Engineer in Charge of Construction, Robert B. Farwell.

## CAMBRIDGE CONNECTION.

ENLARGEMENT OF PLATFORM AND STAIRWAY, PARK STREET  
UNDER.

This work was described in the last annual report. It was continued and the new stairs and westerly side of the passageway opened to travel June 15. The whole work, including the wall finish, was completed August 22, 1922. The work, except the wall finish and the installation of hand rails, was done by employees of the Transit Department. The wall finish was done by the A. V. Day Company, and the hand rails were put in by O. H. Drisko & Co.

Assistant Engineer in Charge of Construction, Robert B. Farwell.

## TREMONT STREET SUBWAY.

LOWERING PLATFORMS AT HAYMARKET SQUARE, ADAMS SQUARE  
AND BOYLSTON STREET STATIONS OF THE TREMONT STREET  
SUBWAY.

The work of cutting down the platforms of the Haymarket square, Adams square and Boylston street stations was done during the summer by employees of this department.

The platforms were cut out in short stretches, considerable of the work being done at night, and oftentimes portions along the track would be covered with planking during the hours of the day when travel was the heaviest. The new granolithic was placed and given a gradual upward slope from the track toward the middle of the platform. The excavated material was taken out at night on dump cars of the Boston Elevated Railway. The sand and crushed stone for the new granolithic was brought in on these cars.

Assistant Engineer in Charge of Construction, Robert B. Farwell.

COLUMN CHANGES, SCOLLAY SQUARE STATION OF THE TREMONT  
STREET SUBWAY.

Changes in the location of certain columns at Scollay square involved the placing of new girders to support the roof beams. This was done by employees of this department between the hours of 1:00 o'clock and 5:00 o'clock in the morning, when there were no cars running through the subway.

Assistant Engineer in Charge of Construction, Robert B. Farwell.

## BOYLSTON STREET SUBWAY.

## ARLINGTON STATION.

*Construction Data.*

## RESTORING STREET PAVEMENT ARLINGTON STREET.

Contractor: Coleman Brothers, Inc.

Date of beginning of work: June 27, 1922.

Date of completion of work: July 18, 1922.

Total amount of work done: Laying Bessemer Brick and furnishing and laying concrete base over a portion of the area, 213 square yards.

Total amount paid, exclusive of brick, \$1,232.63.

Total amount paid for Bessemer Brick, \$495.60.

## RESTORING STREET PAVEMENT BOYLSTON STREET.

Contractor: B. E. Grant Company.

Amount of bid: \$23,200. (See Appendix G).

Date of contract: July 11, 1922.

Date of beginning of work: July 13, 1922.

Time for completion named in contract: 60 days.

Date of certificate of completion: August 14, 1922.

Total amount of work done under the principal items of the contract:

Preparing site, furnishing and laying wood block pavement, including mortar bed, 5,387 sq. yds.; breaking out and removing old concrete base, 562.5 cu. yds.; furnishing and laying 6-inch concrete base, 719.5 cu. yds.; resetting granite edgestones, 384 lin. ft.; re-laying brick sidewalk, 304 sq. yds.; furnishing and laying granolithic sidewalk, 147 sq. yds.; furnishing grout and flooding into stone ballast, 108.74 cu. yds.

Assistant Engineer in charge of work: William W. Lewis.

The work of repaving Boylston street from near Arlington street to near Berkeley street and of repaving Arlington street near Boylston street was made necessary by the construction of the Arlington Station of the Boylston Street Subway. The kind of pavement laid was in both cases the same as that which was found on the street when the work of constructing the Arlington Station began. In order to interfere with the business of the stores and the vehicular traffic along the street as little as possible the work was done on one half of the street at a time. July and August were the months selected in which to do this work as they were the months of lightest business and traffic along the street.

The Boston Elevated Railway Company took this opportunity to lay new track and special work for most of the distance covered by the repaving and co-operated with the contractor in doing all the necessary work.

The tracks were laid upon a concrete base which was from six to eight inches thick. It was necessary to remove this old concrete base in order to bring the new tracks to the grade of the new pavement.

To facilitate the removal of this concrete base the contractor hired the Railway Company's new machine, called a "breaker", which had been designed for this kind of work. This was a machine of very heavy type which was run upon the car tracks and operated by electricity. The breaking of the concrete was done by five heavy weights or hammers. These hammers were so mounted on the machine that three of them would strike a blow on the concrete between the two rails and the remaining two striking one on each side of the track in the "brow." The hammers were heavy iron bars weighing 500 lbs. each with hardened steel points. The hammers were lifted to the desired height and then allowed to drop, one at a time, the steel points striking the concrete and penetrating it to their full depth. Where the concrete was from six to eight inches thick it would be quickly and easily broken into small pieces which could be readily handled by the workmen. Where the concrete was thicker several blows would be required, and, at places, the concrete would be cracked only in large pieces. Generally there was one blow of the five hammers in each space between the ties. This machine proved to be of great value in expediting the removal of the concrete base.

The new pavement on Boylston street had a 6 inch concrete base with a  $3\frac{1}{2}$  inch wooden block, for the wearing surface, laid on a  $\frac{7}{8}$  inch bed of sand.

The pavement on Arlington street was a Bessemer brick wearing surface laid on a 6 inch bed of concrete with an inch bed of sand.

#### STOCKYARD AT C AND CYPHER STREETS, SOUTH BOSTON.

The yard has been under the supervision of Samuel C. Lyman, Assistant Engineer.

The greater part of all structural steel used in the subway and tunnel construction has been fabricated and stored in this yard until sent to the various jobs. Practically all of the tools and miscellaneous equipment and materials have also been stored here, and delivered to the different jobs as called for.

Ironworkers from the yard (in addition to the fifteen iron-

workers permanently at East Boston) have, as occasion required, been sent to erect steel and set underpinning beams at East Boston.

#### TESTING MATERIALS.

The cement received has been tested by Mr. C. N. Ryan, Cement Tester, Public Works Department, at City Hall. All waterproofing materials received have been tested by Mr. L. Y. Waterhouse, Chemist, Public Works Department, also at City Hall. All reinforcing rods and structural steel received have been tested at the mills by Messrs. Robert W. Hunt & Co.

#### ENGINEERING FORCE.

The names of those members of the Engineering Division employed for more than one month are given in Appendix A.

Respectfully submitted,

ERNEST R. SPRINGER,  
*Chief Engineer.*

## APPENDIX A.

Year ending January 31, 1923.

The names of those who have been employed in the Engineering Division for more than one month during the period covered by this report are given below, together with an indication of the principal work upon which they have been engaged.

ARTHUR B. CARTER, *Secretary to the Chief Engineer.*

KATHERINE I. DRISCOLL, *Clerk and Stenographer.*

THOMAS J. PETTIT, *Clerk and Stenographer.*

MARY E. MCKERNAN, *Clerk and Stenographer.*

WILLIAM W. LEWIS, *Assistant Engineer.*

General office work and in charge of paving at Arlington Station.

LEONARD B. HOWE, *Assistant Engineer.*

In charge of engineering office and all designs and details for structural steel and reinforced concrete structures.

JOSEPH W. PARKER, *Assistant Engineer.*

Designs for structural steel and reinforced concrete structures.

FRANCIS V. CAREY, *Assistant Engineer.*

Designs for structural steel and reinforced concrete structures.

ARTHUR V. LYNCH, *Assistant Engineer.*

Designs and detail plans for East Boston Tunnel Alterations.

RALPH A. FISHER, *Assistant Engineer.*

Designs and details for steel work, East Boston Tunnel Alterations.

JAMES D. BURNS, *Assistant Engineer.*

Office work. Plans for steel work for East Boston Tunnel Alterations.

HERBERT R. STEARNS, *Assistant Engineer.*

Designs and detail plans for East Boston Tunnel Alterations.

JOHN A. BERRIGAN, *Draftsman.*

Plans for East Boston Tunnel Alterations.

FRANK A. RULL, *Transitman.*

Blueprinting and photography.

JOHN F. HOWARD, *Blueprinter.*

WILBUR W. DAVIS, *Assistant Chief Engineer.*

In charge of construction of East Boston Tunnel Alterations in Maverick Square.

JOSEPH P. DEVER, *Assistant Engineer.*

Studies, estimates and field work on East Boston Tunnel Alterations.

ROBERT B. FARWELL, *Assistant Engineer.*

In charge of stairway alterations at Park Street Under Station, of construction work of Devonshire Station extension and of lowering platforms of the Tremont-street Subway.

LEO S. STONE, *Assistant Engineer.*

Construction work of stairway widening at Park-street Station, and on extension of the Devonshire Station; plans for East Boston Tunnel Alterations in Maverick Square.

FREDERICK C. H. EICHORN, *Assistant Engineer and Inspector.*

General construction work; East Boston Tunnel Alterations, Maverick Square.

LESTER S. DANIELS, *Assistant Engineer.*

Lines and grades, East Boston Tunnel Alterations, Maverick Square.

ROBERT K. TAYLOR, *Assistant Engineer.*

Progress plans, rod schedules and placing; East Boston Tunnel Alterations, Maverick Square.

JOHN M. WISEMAN, *Assistant Engineer.*

HILLARD C. DONOVAN, *Transitman.*

JOHN L. GEOGHEGAN, *Transitman.*

\*WILLIAM A. ROBERTS, *Transitman.*

\*ROBERT D. ROCHE, *Transitman.*

\*LEO A. RULL, *Transitman.*

THOMAS E. CARNEY, *Rodman.*

\*BENJAMIN W. FINKELSTEIN, *Rodman*

\*THOMAS J. HOMER, JR., *Rodman.*

\*EDWARD P. MCSWEENEY, *Rodman.*

JOHN J. RYAN, *Rodman.*

JOHN J. FARREN, *Construction Cost Accountant.*

GEORGE E. SULLIVAN, *Construction Cost Accountant.*

JOHN J. BRADLEY, *Clerk. (Timekeeper.)*

\*WALTER J. BRENNAN, *Clerk.*

BARTLEY J. CURRAN, *Clerk.*

SAMUEL C. LYMAN, *Assistant Engineer.*

In charge of stockyard and steel shop at Cypher Street.

THOMAS J. MULDOON, *Clerk and Stenographer.*

At stockyard at Cypher Street.

Construction of East Boston Tunnel Alterations in Maverick Square.

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\* Left the employ of the Transit Department.

APPENDIX B.

CANVASS OF BIDS FOR FURNISHING AND DELIVERING THREE USED DOUBLE-DRUM STEAM HOISTING WAGON-DERRICKS AT THE CORNER OF LEWIS AND MARGINAL STREETS, EAST BOSTON. APRIL 6, 1922.  
 (Each derrick capable of hoisting 3,000 pounds on a single line, boom at least 20 feet long, and derrick capable of hoisting 1,500 pounds with boom elevated at 45 degrees when at right angles with body of derrick.)

Bidder.	Prices.			Net total after deducting discount for payment in 10 days from time of delivering each derrick.
	Item (a) 1 derrick.	Item (b) 1 derrick.	Item (c) 1 derrick.	
Coleman Bros., Inc., 49 Medford St., Charlestown.....	\$1,600.00	\$1,100.00	\$1,100.00	Less 1% = \$3,762.00
Rowe Contracting Company, 1500 Salem St., Malden, Mass.....	1,250.00	No bid.	No bid.	Less 0% = \$1,250.00 for one.
Daniel Marr & Son Co., 384 Dorchester Av., South Boston.....	825.00	\$50.00	\$75.00	Less 2% = \$2,499.00

## APPENDIX C.

CANVASS OF BIDS FOR FURNISHING AND DELIVERING AT THE CORNER OF LEWIS AND MARGINAL STREETS, EAST BOSTON, FIVE NEW DOUBLE-DRUM ELECTRIC HOISTING WAGON-DERRICKS, EACH DERRICK TO BE CAPABLE OF HOISTING 3,000 POUNDS ON A SINGLE LINE; MOTOR WOUND FOR A DIRECT CURRENT, 550 VOLTS; BOOM AT LEAST THIRTY FEET LONG, AND DERRICK CAPABLE OF HOISTING 1,500 POUNDS WITH BOOM ELEVATED AT 45 DEGREES WHEN AT RIGHT ANGLES WITH BODY OF DERRICK. MAY 2, 1922.

Bidder.	Price bid.	Total.	Net total after deducting discount for payment in ten days from time of delivering each derrick.	Time for Delivery.
Mead-Morrison Manufacturing Co., 125 Prescott St., East Boston.....	\$2,950 00	\$14,750 00	Less 2 per cent. = \$14,455.00.....	Three weeks after receipt of order.
P. I. Perkins Co., 261 Franklin St., Boston.....	2,488 00	12,440 00	Less 0 per cent. = 12,440.00.....	Eight weeks from date.
The Euclid Crane & Hoist Co., Euclid, Ohio.....	2,315 00	11,575 00	Less 1 per cent. = 11,459.25.....	July 20, 1922.
National Hoisting Engine Co., 317 Manor Avenue, Harrison, N. J.....	2,290 00	11,450 00	Less half of 1 per cent. = 11,392.75..	July 7, 1922.

APPENDIX D.

CANVASS OF BIDS FOR FURNISHING NEW DOUBLE-DRUM ELECTRIC HOISTING WAGON DERRICKS. MAY 11, 1922.

(Each derrick capable of hoisting 3,000 pounds on a single line, motor wound for a direct current of 550 volts, boom at least 30 feet long and derrick capable of hoisting 1,500 pounds with boom elevated at 45 degrees when at right angles with body of derrick.)

Bidder.	Price and time of delivery in calendar days from the date of the award of the Contract.					Net total after deducting discount for payments in 10 days from time of delivering each derrick.
	Item (a) 1 derrick.	Item (b) 1 derrick.	Item (c) 1 derrick.	Item (d) 1 derrick.	Item (e) 1 derrick.	
Mead-Morrison Manufacturing Co., 125 Prescott St., East Boston.....	\$3,097.50 40 days.	\$3,097.50 47 days.	\$3,097.50 55 days.	\$3,097.50 55 days.	\$3,097.50 55 days.	\$15,487.50
P. I. Perkins Co., 261 Franklin St., Boston, Mass.....	2,888.00 About 4 weeks from date of receipt of order.	2,888.00 About 5 weeks from date of receipt of order.	2,888.00 About 5 weeks from date of receipt of order.	2,888.00 About 6 weeks from date of receipt of order.	2,888.00 About 6 weeks from date of receipt of order.	14,440.00
The Euclid Crane & Hoist Co., Euclid, Ohio.....	2,200.00 45 days.	2,200.00 45 days.	2,200.00 60 days.	2,200.00 60 days.	2,200.00 60 days.	11,000.00
National Hoisting Engine Co., 317 Manor Ave., Harrison, N. J.....	2,190.00 21 days.	2,190.00 21 days.	2,190.00 30 days.	2,190.00 30 days.	2,190.00 30 days.	10,950.00

All bids were rejected.

APPENDIX F.

CANVASS OF BIDS FOR FURNISHING AND DELIVERING AT COMMONWEALTH PIER No. 1, EAST BOSTON, WITH ALL CHARGES PREPAID 25,000 BARRELS OF PORTLAND CEMENT NOT TO CONTAIN OVER SIX PER CENT. OF ALUMINA BY ANALYSIS. JUNE 20, 1922.

Bidder.	Brands.	Price per barrel including four cloth bags.	Credit for returned bags, per bag.		Discount for payment in ten days from receipt of bills, per barrel.	Net price per barrel with four bags returned.			
			At warehouse.	At mill.		To warehouse.	To mill.	To warehouse and discount taken.	To mill and discount taken.
Boston Building Material Co., 370 Albany Street, Boston, Mass.....	Lehigh or Saylor.	\$3.04	\$0.07	\$0.10	\$0.10	\$2.76	\$2.64	\$2.66	\$2.54
William S. Simpson, Inc., 101 Milk Street, Boston, Mass.....	Lehigh or Atlas.								
Joseph P. O'Connell & Co., 922 Tremont Building, Boston, Mass...	Allentown.								
J. Massirman & Co., 137 Everett Avenue, Chelsea, Mass.....	Allentown.								
Portland Stone Ware Co., 49 Federal Street, Boston, Mass.....	Whitehall.	2.94	0.075	0.10	0.10	2.64	2.54	2.54	2.44

All bids were rejected.

## APPENDIX E.

CANVASS OF BIDS FOR FURNISHING AND PLACING WALL FINISH ON THE WALLS, CEILINGS AND PARAPETS OF THE NEW STAIRWAY NO. 6 AND THE PASSAGeway LEADING TO THE EAST BOUND PLATFORM OF THE PARK STREET UNDER STATION OF THE CAMBRIDGE CONNECTION. MAY 25, 1922.

BIDDER.	60 sq. yds. white glazed tile. 3" x 6".	12 sq. yds. red glazed tile. 3" x 6".	13 sq. yds. ceramic mosaic tile.	165 sq. yds. white cement plaster.	200 sq. yds. ce- ment plaster backing 1" to 1 1/2" thick.	85 sq. yds cement backing 3/4" to 1 1/2" thick.	10 sq. yds. grey cement finish plaster in adver- tising panels.	25 sq. yds sanitary base.	250 lin. ft. arries and exterior corners.	Totals.	Time of completion.
George A. Craffey Co., 816 Old South Bldg., Boston.....	\$11.00 660.00	\$18.00 216.00	\$25.00 325.00	\$1.85 305.25	\$1.00 200.00	\$2.00 170.00	\$2.00 20.00	\$2.75 68.75	\$0.30 75.00	\$2,040.00	Five weeks after work is started.
Waldo Brothers & Bond Co., 181 Congress St., Boston.....	\$12.06 723.60	14.76 177.12	19.26 250.38	1.25 206.25	0.80 160.00	1.35 114.75	1.25 12.50	1.25 31.25	0.15 37.50	1,713.35	15 working days.
Galassi Mosaic and Tile Company, Bennet & Ash Sts., Boston.....	9.90 594.00	15.00 180.00	22.00 286.00	1.50 247.50	0.70 140.00	1.25 106.25	1.00 10.00	2.00 50.00	0.20 50.00	1,663.75	4 weeks or sooner.
A. V. Day & Company, 1 Washington St., Boston.....	10.00 600.00	13.50 162.00	18.00 231.00	1.25 206.25	0.80 160.00	1.35 114.75	1.25 12.50	1.25 31.25	0.15 37.50	1,558.25	In 20 working days after award of contract.



## APPENDIX G.

### CANVASS OF BIDS FOR PAVING BOYLSTON ST., OVER ARLINGTON STATION. JUNE 20, 1922.

BIDDER.	5,200 sq. yds. granite and wood blocks removed, excavation, etc.	200 cubic yds concrete base removed	Furnishing all material and laying 5,200 sq. yds. wood block pavement.	600 cubic yds. concrete base.	Resetting 400 linear feet granite edgestone.	Furnishing all material (except brick) for relaying 500 sq. yds. of brick sidewalk.	Furnishing and placing 100 sq. yds. of granite lithic sidewalk	Furnishing and preparing 50 cu. yds of grout floored into broken stone ballast.	Furnishing all material and laying 100-sq. yds temporary paving with granite blocks now on street.	Wages of laborer.	Total.	Time of completion.
	Item a	2a	b	c	d	e	f	g	j	k		
Saml. J. Tomasello, 11 Cushing Terrace, Dorchester, Mass.	80 75 3,900 00	\$6 00 1,200 00	\$3 50 18,200 00	\$8 50 5,100 00	80 35 140 00	\$0. 75 375. 00	\$2. 75 275 00	\$12 00 600 00	\$1. 00 100 00	\$0. 50	\$29,890	Sept. 30, 1922.
Mt. Pleasant Const. Co., 43 Tremont St., Boston, Mass. . . .	0 30 1,560 00	3. 00 600 00	3 25 17,420 00	8 00 4,800 00	0 30 120 00	0. 60 300 00	2 25 225. 00	10 00 500 00	0 80 80 00	0 50	25,605	40 working days.
Coleman Bros. Inc., 49 Medford St., Charlestown, Mass. . .	0 40 2,080 00	5. 00 1,000 00	3 00 15,600 00	9 00 5,400. 00	0 40 160 00	0 50 250 00	2 50 250 00	14 00 700 00	1. 00 100 00	0. 40	25,540	60 days after starting.
William J. Barry, 431 Ashland St., Boston, Mass. . . .	0 50 2,600 00	1 50 300 00	3 00 15,600 00	9 00 5,400 00	0 50 200 00	0 50 250 00	3 00 300 00	15 00 750 00	1 00 100 00	0 50	25,500	4 weeks after starting.
Rowe Cont. Co., 1215 Center St., Boston, Mass. . . .	0 40 2,080 00	2 50 500 00	2 80 14,560 00	7 50 4,500 00	0 30 120 00	1 00 500 00	2 50 250 00	12 00 600 00	1 60 160 00	0 50	23,270	Sept. 1, 1922.
B. E. Grant Co., 100 Floyd St., Roxbury, Mass.	0 35 1,820 00	3 00 600 00	2 85 14,820 00	7 50 4,500 00	0 20 80 00	0 50 250 00	1 80 180. 00	17. 00 850. 00	1 00 100 00	Prevailing rate.	23,200	60 days after starting.



## APPENDIX H.

CANVASS OF BIDS FOR 115 TONS OF ASPHALT F. O. B. COMMONWEALTH PIER NO. 1,  
EAST BOSTON, JUNE 22, 1922.

BIDDER.	Price per ton Delivered.	Amount.	Time of delivery.
Standard Oil Co., of New York, New England Department, 50 Congress St., Boston.....	\$22.78 22.25	\$2,619.70 2,558.75	Shipment to be made promptly on receipt of order. Shipment after July 1, 1922.
The Texas Company, 715 Tremont Bldg., Boston.....	19.20	* 2,208.00	Within ten days from receipt of order.

\* Awarded. Contract 745.

## APPENDIX I.

CANVASS OF BIDS FOR 9,000 TONS OF SAND TO BE DELIVERED IN TRUCK-LOAD LOTS, AS CALLED FOR, ALONG THE LINE OF THE WORK IN THE VICINITY OF MAVERICK SQUARE, EAST BOSTON, TO DECEMBER 1, 1923. JUNE 22, 1922.

BIDDER.	Price Per Ton.	Amount.
M. Doyle & Co., Inc., 22 Weld Ave., Roxbury, Mass. ....	\$1.60	\$14,400.00
P. O'Riorden, 5 Chelsea St., Charlestown, Mass. ....	1.43	12,870.00
A. De Stefano Co., 10 Everett St., East Boston, Mass. ....	1.40	*12,600.00

\* Awarded. Contract 748.

## APPENDIX J.

CANVASS OF BIDS FOR 22,000 TONS OF CRUSHED STONE TO BE DELIVERED ALONG THE LINE OF THE WORK IN EAST BOSTON, IN THE VICINITY OF MAVERICK SQUARE, IN TRUCKLOAD LOTS AS CALLED FOR, BETWEEN DATE OF CONTRACT AND DECEMBER 1, 1923. JUNE 22, 1922.

BIDDER.	Price Per Ton Delivered.	Amount.
The Lynn Sand & Stone Company.. Swampscott, Mass.	\$1.90 less 1 per cent. discount for payment within 10 days of presenting bills \$1.881,	\$41,382.00
Rowe Contracting Company, 1500 Salem St., Malden, Mass.	1.69	*37,180.00

\* Awarded. Contract 747.

## APPENDIX K.

CANVASS OF BIDS FOR ABOUT 36 TONS OF STRUCTURAL STEEL BEAMS, FURNISHED AND DELIVERED, STOCKYARD AT 14 CYPHER STREET,  
SOUTH BOSTON. JUNE 22, 1922.

BIDDER.	67,750 lbs. 30'-200-lb.	1,817 lbs. 12'-64.5-lb.	2,912 lbs. 12'-112-lb.	Totals.	Time of Delivery.
Bethlehem Steel Company, Bethlehem, Penn.....	\$0.02355 1,595.51	\$0.02355 42.79	\$0.02355 68.58	\$1,706.88	Within 70 working days from date of order.
Boston Structural Steel Company..... 240 Albany St., Cambridge, Mass.....	0.0235 1,592.13	0.0235 42.70	0.0225 65.52	* 1,700 35	Within 60 working days from date of order.

\* Awarded. Contract 749.

## APPENDIX L.

CANVASS OF BIDS FOR 50,000 SQUARE YARDS OF ASPHALT SATURATED COTTON FABRIC F. O. B.  
COMMONWEALTH PIER No. 1, EAST BOSTON, JUNE 22, 1922.

BIDDER.	Price per square yard.	Amount.	Time of Delivery.
Samuel Cabot, Inc., 141 Milk St., Boston .....	\$0.21	\$10,500.00	In lots as requested the first lot thirty days after placing of the contract.
Minwax Company, Inc., 18 East 41st St., New York City.....	0.19	9,500.00	Fifteen thousand yards immediately on receipt of contract and the balance as required.
Johns-Mansville Inc., of Massachusetts, 55 High St., Boston .....	0.185	* 9,250.00	

\* Awarded. Contract 746.

## APPENDIX M.

CANVASS OF BIDS FOR ABOUT 123 TONS OF STRUCTURAL STEEL BEAMS, FURNISHED AND DELIVERED, COMMONWEALTH PIER NO. 1, EAST BOSTON, JUNE 29, 1922.

BIDDER.	Price per lb. for:	Amount.	Time of delivery.
	76,433 lbs. 30-in.-200 lb. beams 170,580 " 30-in.-180 " " 247,013 " (about 123 tons.)		
Bethlehem Steel Company, Bethlehem, Penn.....	\$0.02355	\$5,817.16	Within 70 working days from date of order.

Awarded. Contract 751.

APPENDIX N.

CANVASS OF BIDS FOR ABOUT 172 TONS OF STEEL BEAMS, FURNISHED AND DELIVERED, 14 CYPHER STREET, SOUTH BOSTON. JULY 6, 1922.

Bidder.	Boston Structural Steel Company, 240 Albany St., Cambridge.		Bethlehem Steel Company,* Bethlehem, Penn.	
	Time of delivery.	Within 90 working days from date of order.	Within 70 working days from date of order.	
Items.	Price bid per lb.	Amount.	Price bid per lb.	Amount.
146,016 pounds 30-in. 200-lb. beams.....	\$0.02415	\$3,526.29	\$0.02315	\$3,380.27
91,447 pounds 30-in. 180-lb. beams.....	0.02415	2,208.45	0.02315	2,117.00
7,673 pounds 28-in. 165-lb. beams.....	0.02415	185.30	0.02315	177.63
15,077 pounds 28-in. 105-lb. beams.....	0.02415	364.11	0.02315	349.03
7,713 pounds 26-in. 150-lb. beams.....	0.02415	186.27	0.02315	178.56
29,400 pounds 24-in. 140-lb. beams.....	0.02365	695.31	0.02215	651.21
7,840 pounds 20 in. 140-lb. beams.....	0.02365	185.42	0.02215	173.66
5,088 pounds 20-in. 64-lb. beams.....	0.02365	120.33	0.02165	110.16
32,329 pounds H-sections.....	0.02415	780.75	0.02315	748.42
Totals.....		\$8,252.23		\$7,885.94

\* Awarded. Contract 752.

APPENDIX O.

CANVASS OF BIDS FOR ABOUT 144 TONS OF STEEL BEAMS, FURNISHED AND DELIVERED, 14 CYPHER ST., SOUTH BOSTON. JULY 27, 1922.

Time of delivery.....	Bid of Boston Structural Steel Co., 240 Albany St., Cambridge, Mass.		* Bid of Bethlehem Steel Co., Bethlehem, Penn.	
	Price bid, per pound.	Amount.	Price bid, per pound.	Amount.
	65 working days from date of order.		75 working days from date of order.	
Items.	Price bid, per pound.	Amount.	Price bid, per pound.	Amount.
51,165 pounds 30-in-180-lb. beams.....	\$0.02365	\$1,210.05	\$0.02365	\$1,210.05
61,797 pounds 24-in-140-lb. beams.....	0.02315	1,430.60	0.02265	1,399.70
35,700 pounds 24-in-120-lb. beams.....	0.02315	826.46	0.02265	808.61
1,351 pounds 24-in-73-lb. beams.....	0.02315	31.28	0.02215	29.92
6,160 pounds 20-in-140-lb. beams.....	0.02315	142.60	0.02265	139.52
18,480 pounds 20-in-112-lb. beams.....	0.02315	427.81	0.02265	418.57
767 pounds 20-in-59-lb. beams.....	0.02315	17.76	0.02215	16.99
16,640 pounds 15-in-104-lb. beams.....	0.02265	376.90	0.02215	368.58
14,805 pounds 15-in-71-lb. beams.....	0.02215	327.93	0.02115	313.13
12,192 pounds 15-in-64-lb. beams.....	0.02215	270.05	0.02115	257.86

6,875 pounds 15-in-55-lb. beams.....	0 .02215	145.41	0 .02065	141.97
2,975 pounds 10-in-35-lb. beams.....	0 .02115	62.92	0 .02065	61.43
60,346 pounds H-sections.....	0 .02365	1,427.18	0 .02365	1,427.18
Totals.....	.....	\$6,696.95	.....	\$6,593.51
Less discount of quarter of one per cent for payment in ten days after receipt of material.....	.....	16.74	No discount.	
		\$6,680.21		

\* Awarded. Contract 753.









